NASA TECHNICAL NOTE

NASA TN D-4865

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NASA TN D-4865

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by Charlie M. Jackson, Jr., Wallace C. Sawyer, and Rudeen S. Smith

Langley Research Center
Langley Station, Hampton, Va.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION • WASHINGTON, D. C. • NOVEMBER 1968

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SUMMARY

Existing theoretical techniques have been modified and combined to provide a method for computing surface-pressure distributions on blunt bodies with spherical nose caps and arbitrary afterbody shapes at small angles of attack. The method consists basically of modified Newtonian theory in the stagnation region with second-order shock-expansion theory used when the surface flow becomes supersonic. The second-order shock-expansion theory is most conveniently applied to rotationally symmetric bodies; therefore, to use this theory at small angles of attack, the body meridian lines are used to generate equivalent bodies of revolution from which the meridian pressure distributions are obtained.

A complete, consistent set of experimental surface-pressure data is presented for two typical blunt reentry configurations to permit evaluation of the present theoretical methods. The test conditions provide surface-pressure distributions for six Mach numbers from 1.50 to 4.63 and four angles of attack from 0° to 12° for each model. A comparison of the present theoretical method with these experimental data indicates that this method gives adequate engineering estimates of the surface pressures on blunt bodies at moderate angles of attack except where flow separation or detached secondary shock waves are present.

The experimental pressures were integrated to give forces and moments for the angle-of-attack range, and a comparison of the present theoretical method and modified Newtonian theory was made. In general, the present method did not show significantly better agreement with the experimental axial force than did the Newtonian theory. However, in the lower Mach number range, the present method generally showed improved agreement with the experimental normal force. As was the case with the surface pressures, the present method gave adequate engineering estimates of the forces and moments except where large areas of flow separation or detached secondary shock waves occurred.

INTRODUCTION

The determination of the inviscid aerodynamic force and moment characteristics of a blunt body of revolution requires a knowledge of the surface-pressure distribution for the body. Several theoretical methods are available for calculating these surface pressures on blunt bodies at angle of attack in a supersonic flow field. Of these methods, the Newtonian theory and the three-dimensional method of characteristics represent the two extremes of complexity. The Newtonian theory, although simple to use, is limited by the assumption that the pressure on any leeward surface is equal to free-stream pressure. This limitation can result in serious errors in the aerodynamic coefficients, especially at low supersonic Mach numbers. However, a solution by the three-dimensional method of characteristics, if properly done, is an exact representation of the inviscid flow field for any supersonic Mach number. In order to obtain a solution by the method of characteristics, the subsonic flow field in the stagnation region must be defined and then the characteristics at a point downstream of the sonic line must be matched. The solution of the subsonic flow field and the method of characteristics are sufficiently complicated to demand the use of the most sophisticated high-speed digital-computing equipment.

Some attempts have been made to develop methods which account for the low pressure on the leeward side of the body without involving the complexities of the method of characteristics. The use of Prandtl-Meyer expansion theory in conjunction with the Newtonian method is typical of these efforts. An example of this technique is presented in reference 1. In reference 1, Newtonian theory is used to establish the pressure distribution to the sonic point. Prandtl-Meyer expansion theory is then used from the sonic point to the juncture of the spherical cap with the conical section of the body, and a modified-tangent-cone method is used to determine the flow conditions on the conical section. Reference 1 indicates that this approach gives good agreement for the aerodynamic characteristics of blunt cones in the hypersonic-speed range (6.80 < Mach number < 10.10).

There is a notable lack of comparison of the various blunt-body theories with experiment in the supersonic-speed range (2.00 < Mach number < 4.00) at angles of attack. The present paper is an attempt to provide a relatively simple method of calculating the aerodynamic characteristics of blunt bodies of revolution with spherical nose caps at angles of attack in the supersonic-speed range. The theoretical technique is similar to that of reference 1 with the notable exception that the Prandtl-Meyer expansion and tangent-cone methods are replaced by the second-order-shock-expansion method of reference 2.

The results of the theoretical calculations are compared with experimental pressure distributions for two typical blunt reentry configurations. These experimental pressure distributions are presented for Mach numbers from 1.50 to 4.63, for an

angle-of-attack range from 0° to 12°, and for a Reynolds number range from 2.59×10^6 to 3.00×10^6 per foot (8.50×10^6 to 9.84×10^6 per meter).

SYMBOLS

The units used for the physical quantities in this paper are given both in U.S. Customary Units and in the International System of Units (SI). Factors relating the two systems are given in reference 3. The reference center for moments is taken at the nose of the models.

C_A	axial-force coefficient, $\dfrac{\text{Axial force}}{q_\infty S}$
C_m	pitching-moment coefficient, $\dfrac{\text{Pitching moment}}{q_\infty S l}$
C_N	normal-force coefficient, $\dfrac{\text{Normal force}}{q_\infty S}$
C_p	pressure coefficient, $\dfrac{p_s - p_\infty}{q_\infty}$
d	base diameter, feet (meters)
l	body length, feet (meters)
M	Mach number
p	static pressure, pounds/foot^2 (newtons/meter^2)
q	dynamic pressure, pounds/foot^2 (newtons/meter^2)
r	radius of spherical nose cap (fig. 1), feet (meters)
R	Reynolds number
S	area of model base, feet^2 (meters^2)
s	distance along body meridian measured from nose (fig. 1), feet (meters)
T	temperature, degrees Fahrenheit (degrees Kelvin)

x,y	coordinates (fig. 1), feet (meters)
α	angle of attack, degrees
γ	ratio of specific heats (1.4 for present analysis)
δ	angle of inclination of tangent plane at body surface to airflow, degrees
θ	angular position measured counterclockwise about center line of model (fig. 1); meridian angle, degrees

Subscripts:

∞	free-stream conditions
c	conditions on cone with attached shock
s	conditions on body surface
t	stagnation conditions
w	wind axis

ANALYSIS

Nonlifting Body

The present development of a method for calculating the pressure distribution on a blunt body of revolution of zero angle of attack involves a combination of simple approximate theories used to take advantage of each theory in its appropriate flow regime. The present method is similar to that of reference 1 in that the calculated pressures along a streamline are derived from one of three basic flow conditions: subsonic flow in the region of the stagnation point, supersonic expansion, and supersonic compression.

In the region of the stagnation point, the surface pressures can be adequately predicted by Newtonian method if the normal-shock equations are used to determine the stagnation pressure. The expression used for the surface pressures in the stagnation region is

$$\frac{p_s}{p_\infty} = \left\{ \left[\frac{(\gamma + 1)M_\infty^2}{2}\right]^{\frac{\gamma}{\gamma-1}} \left[\frac{\gamma + 1}{2\gamma M_\infty^2 - (\gamma - 1)}\right]^{\frac{1}{\gamma-1}} - 1 \right\} \sin^2\delta + 1 \tag{1}$$

In order to obtain the surface Mach number variation in this region, an isentropic expansion from the stagnation point is assumed and the resulting variation is given by

$$M_s = \sqrt{\frac{2}{\gamma - 1}\left(\left\{\frac{p_s/p_\infty}{\left[\frac{(\gamma + 1)M_\infty^2}{2}\right]^{\frac{\gamma}{\gamma-1}}\left[\frac{\gamma + 1}{2\gamma M_\infty^2 - (\gamma - 1)}\right]^{\frac{1}{\gamma-1}}}\right\}^{-\frac{\gamma-1}{\gamma}} - 1\right)} \tag{2}$$

After the flow along the surface becomes supersonic and begins to expand rapidly, the Newtonian method can give large errors in surface pressure. In this region, a theoretical method, appropriate to supersonic expanding flows, must be matched to the Newtonian calculations. The success of such a matching process is dependent on the theory used, as well as the criterion for the match point. Reference 1, for example, uses a simplified version of a Prandtl-Meyer expansion method from the sonic point on. This method gives good agreement at the higher Mach numbers ($6.80 < M_\infty < 10.00$). In the present paper the second-order shock-expansion method of reference 2 is used from a point arbitrarily chosen to be the point where the surface slope is the same as that required for shock attachment to a two-dimensional wedge at the free-stream Mach number. This point was chosen simply because it gave the best agreement with the available data in the low supersonic-speed range. The second-order shock-expansion method has the advantage over a simple Prandtl-Meyer expansion method because it accounts to some degree for the overexpansion phenomenon. The second-order shock-expansion method can also be used to evaluate rather large compression effects.

The basic approach of the second-order shock-expansion method is to treat the body as if it was composed of many cone frustums. As the calculation proceeds downstream on the body surface, a Prandtl-Meyer expansion or an oblique-shock compression (whichever is appropriate) is used at the juncture of two cone frustums to evaluate the conditions at the start of the downstream element. In order to establish the variation of flow conditions over the second frustum, a series is defined to allow the initial conditions for that

frustum to approach conical values if the frustum is indefinitely long. This series is then used to establish conditions just before the juncture with the next cone frustum, and the calculation proceeds from one elemental cone frustum to the next along the body of revolution. The details of the second-order shock-expansion method and the attendant calculating procedure are well documented in reference 2 and, therefore, they are not repeated here. One difficulty with this method (as pointed out in ref. 2) is the possibility of divergence of the series used to evaluate the pressure variation on an elemental frustum. This condition is usually encountered in regions where large expansions or compressions occur. For the condition of a divergent series, the flow properties on the particular frustum can be assumed constant for that element and the calculation proceeds to the next frustum (classical shock-expansion theory).

Many blunt bodies have flare afterbodies for stability and to provide convenient adapter fairings to their boosters. In the low supersonic-speed range, these flares usually result in detached shock waves and the shock-expansion methods do not give a solution for these conditions. In order to provide at least an estimate of the flow parameters on the flare afterbodies when the flare shock is theoretically detached, the present analysis resorts to the technique described in reference 4. Reference 4 describes essentially a method of analyzing secondary flow fields by considering the flare disturbance as an embedded Newtonian impact flow. The expression from reference 4 for the pressure coefficient on the flare afterbody is

$$C_{p,2} = C_{p,1} + 2\frac{q_1}{q_\infty}\sin^2\delta_2 \tag{3}$$

where the subscripts 1 and 2 refer to conditions before and after the flare juncture, respectively.

Lifting Body

The calculation of the surface pressures on a body of revolution is considerably more complicated when the body is inclined to the flow. When the body is not inclined, the meridian lines on the surface are coincident with the streamlines, and the analysis used for the nonlifting body is adequate. At incidence, the streamlines deviate considerably from the meridian lines because of the crossflow component of the flow on the surface. If the shape of the streamlines can be approximated and this shape used to generate a body of revolution, it is reasonable to assume that the analysis for the nonlifting body can be used to provide the pressure variation along a meridian of this equivalent body of revolution and, therefore, along the streamline itself.

The approach taken in the present analysis is to obtain the coordinates of the streamlines in the vertical plane ($\theta = \pm 90^\circ$ in fig. 1) for the body of revolution at angle

of attack by transforming the body-axis coordinates into the wind-axis system. This transformation results in a rotation of the coordinate system. In order to maintain the spherical nose cap for the transformed coordinates, the center of rotation is taken to be the center of the sphere. The streamline for $\theta = 0^{\circ}$ is approximated by the body-axis coordinates of a meridian of the true body shape. These assumptions imply that the coordinates of the streamlines on the body at angle of attack vary from body-axis coordinates at $\theta = 0^{\circ}$ to wind-axis coordinates at $\theta = \pm 90^{\circ}$. This variation is represented for $90^{\circ} \geqq \theta \geqq -90^{\circ}$ by the expressions

$$x_w = \left\{ \frac{r(\cos\alpha - 1) + x + \left[y \cos\alpha - (x - r)\sin\alpha\right]\sin\alpha}{\cos\alpha} - x \right\} \sin\theta + x \tag{4a}$$

$$y_w = \left[y \cos\alpha - (x - r)\sin\alpha - y\right]\sin\theta + y \tag{4b}$$

With the use of equations (4a) and (4b), the coordinates of the streamlines in the wind-axis system are obtained and these coordinates are used to generate bodies of revolution for each radial angle θ of interest. The estimates of the pressure distributions along the body-axis meridians of the body of revolution are obtained by applying the analysis used for the nonlifting body to the equivalent bodies generated from the streamlines. An example of the bodies of revolution representing the streamlines on a typical blunt body with a flared afterbody at angle of attack is shown in figure 2 for several values of θ. The use of this concept involves two basic limitations; first, that the angle of attack remain small enough for the stagnation point to remain on the spherical cap; and second, that the angle of attack remain small enough for the coordinates of the equivalent body for $\theta = 90^{\circ}$ to remain positive.

Such a system of approximate transformations can only result in engineering estimates of the streamline shape as well as the pressure variation along the meridians. An examination of these transformations (eqs. (4a) and (4b)) does show that, as the incidence approaches zero, the approximate streamline shapes approach the body meridian shapes (true streamline shapes at $\alpha = 0^{\circ}$). This approach should, therefore, be valid for the case where the body incidence is small.

The theoretical method described for determining the surface pressures of blunt bodies at incidence has been programed for high-speed digital computation. The computer program provides the surface pressures and Mach numbers for the desired meridian lines as well as the integration of these pressures to provide forces and moments. A detailed description of the program, including a listing of the source program and a sample input and output, is presented in the appendix.

EXPERIMENT

A test program was conducted to determine the surface-pressure distributions on two typical blunt bodies of revolution in the supersonic-speed range. This test program was designed to provide a complete, consistent set of pressure data on blunt bodies by which analytical methods could be evaluated in the Mach number range from $M_\infty = 1.50$ to $M_\infty = 4.63$ and at angles of attack from 0° to 12°.

Models, Apparatus, and Test Conditions

The layout of the models is shown in figure 3 and model photographs are presented in figure 4. Model 1 (fig. 3(a)) consists of a blunted cone with an 11.50° half-angle. Model 2 (fig. 3(b)) consists of a blunted cone with a 2.75° half-angle and a flare afterbody having an 18.50° half-angle. The models were instrumented with two rows of pressure orifices located 180° apart. Remote control of model roll angle through 90° was provided so that complete pressure distributions might be obtained.

Tests were conducted in both the low and the high Mach number test sections of the Langley Unitary Plan wind tunnel which is a variable-pressure continuous-flow tunnel. The test sections are 4 feet square and 7 feet long. The nozzles leading to the test sections are of the asymmetric sliding-block type, which permits a continuous variation in Mach number from 1.47 to 2.86 in the low Mach number test section, and from 2.29 to 4.63 in the high Mach number test section.

Tests were performed at the conditions shown in the following table:

M_∞	T_t		p_t		R	
	$^\circ$F	$^\circ$K	lbf/ft^2	N/m^2	per foot	per meter
1.50	150	339	1440	68 950	2.59×10^6	8.50×10^6
1.90	150	339	1642	78 600	2.59	8.50
2.30	150	339	2298	110 000	3.00	9.84
2.96	150	339	3253	155 700	3.00	9.84
3.95	175	353	5794	277 400	3.00	9.84
4.63	175	353	7913	378 800	3.00	9.84

No attempt was made to artificially induce boundary-layer transition. The dewpoint, measured at stagnation pressure, was maintained below -30° F (239° K) to assure negligible condensation effects.

Accuracy

The accuracy of the measured quantities, based on calibration and repeatability of data, is estimated to be within the following limits:

C_p	±0.01
α, deg	±0.10
M_∞ = 1.50 to 2.96	±0.015
M_∞ = 3.95 to 4.63	±0.05

The model angle of attack was corrected in the tunnel to compensate for flow angularity.

RESULTS AND DISCUSSION

Pressure Distributions

The present method has been developed to obtain the pressure distributions on blunt bodies of revolution in the supersonic-speed range. The method has been applied to the configurations described in figure 3 (models 1 and 2) for the test conditions previously described. A comparison of the calculated and experimental pressure distributions is made to evaluate the present method, and the tabulated experimental pressure data for models 1 and 2 are presented in tables I to XII.

Figure 5 presents the experimental and theoretical pressure distributions on models 1 and 2 at six Mach numbers from 1.50 to 4.63 for $\alpha = 0^\circ$. The experimental results shown in figure 5(a) for model 1 indicate three basic areas of interest: first, the stagnation region ($0 < s/l < 0.10$) where the pressures are high and the flow mostly subsonic; second, the overexpansion area which occurs at the juncture of the spherical cap and conical afterbody ($s/l = 0.14$) (at this point, the pressures may expand well below conical pressure for the cone afterbody); third, the region in which the pressure recovers from the overexpanded value to conical pressure ($s/l > 0.14$). The comparison of the present theoretical method with experiment indicates good agreement in the stagnation region at all Mach numbers considered. Figure 5(a) also indicates that the present method agrees well with experiment in the areas of the overexpansion and recovery to conical pressure, except at the low Mach numbers where the experiment shows larger overexpansion effects and more rapid recovery to conical pressures.

The results of modified Newtonian theory are also shown in figure 5(a). Although the Newtonian pressure distributions are in good agreement with the experiment at the higher Mach numbers, the results of figure 5(a) indicate that Newtonian theory is not capable of predicting any of the details of the overexpansion effects which become quite important at the lower supersonic Mach numbers.

The experimental results shown in figure 5(b) for model 2 indicate the effects of a flare afterbody on the pressure distributions for a blunted cone. The data of figure 5(b) indicate that the pressure rise associated with the flare apparently occurs downstream of the flare juncture at $M_\infty \geqq 2.96$. A closer examination of this phenomenon, with the help of shadowgraphs, indicates that at $M_\infty \geqq 2.96$, the laminar boundary layer separates upstream of the flare juncture to produce a weak compression and reattachment occurs downstream of the flare juncture to produce a strong compression. Reference 5 indicates that, for laminar boundary layers, separation would occur over the entire Mach number range of the present test and, furthermore, that the length of the separated layer would increase with decreasing Mach number. The experimental results shown in figure 5(b) do not agree with this trend. The pressure distribution associated with separation is well established and is characterized by a weak compression occurring upstream of the flare. As previously mentioned, such a weak compression occurs in the present data only for $M_\infty \geqq 2.96$. The results for the lower Mach numbers would therefore indicate attached or nearly attached flow. This indication is contrary to the anticipated trend of the variation of incipient separation with Mach number for a laminar boundary layer and suggests the possibility that the attached flow at the lower Mach numbers is associated with a turbulent boundary layer.

A comparison of the present theoretical method with experiment for model 2 (fig. 5(b)) indicates good agreement in the stagnation region ($0 < s/l < 0.20$) for the entire range of Mach numbers. In the region of the overexpansion and recovery to conical pressure ($0.30 < s/l < 0.77$), the agreement ranges from good to fair as the Mach number decreases from 4.63 to 1.50. Figure 5(b) indicates that the present theory accurately predicts the pressure rise due to the flare afterbody in the Mach number range from 1.90 to 2.96. At $M_\infty = 1.50$, the shock wave produced by the flare is not theoretically attached. For this condition, the present method uses the embedded Newtonian theory of reference 4 which apparently does not give good results at low Mach numbers. The disagreement of the present method with experiment at the high Mach numbers is due to the condition of separated flow on the flare as previously discussed.

The pressure distributions determined from the modified Newtonian theory for model 2 are also included in figure 5(b). As was the case for model 1, the Newtonian methods are inadequate in the overexpansion region, especially at Mach numbers below 2.30. Figure 5(b) also indicates very poor agreement between the Newtonian methods and the experimentally determined pressures on the flare at the lower Mach numbers.

In order to evaluate the equivalent-body concept of the present method, radial pressure distributions are shown in figure 6 for selected longitudinal stations on model 2 at angles of attack. The longitudinal stations shown are located at the juncture of the blunt nose with the conical section ($s/l = 0.33$), on the conical section ($s/l = 0.60$), and on the flare ($s/l = 1.00$). Although the prime assumption of the equivalent-body concept is that

no crossflow exists on the body at angle of attack, it is of more importance to the validity of the present method that the surface pressure be independent of the crossflow.

Intuitively, maximum crossflow occurs near the meridian line for $\theta = 0^{\circ}$. The effect of the presence of a crossflow component on the surface pressure can be evaluated by examining the experimental pressure variation with angle of attack for the meridian at $\theta = 0^{\circ}$. For example, at $M_{\infty} = 1.50$, figure 6(a) indicates no variation in C_p from $\alpha = 0^{\circ}$ to 12° at $s/l = 0.33$ and $\theta = 0^{\circ}$; therefore, no crossflow effect is indicated. However, if the variation of C_p with α is examined for $s/l = 1.00$, figure 6(a) indicates a large crossflow effect on the flare at $\alpha = 12^{\circ}$. This effect reduces to a negligible amount at $\alpha = 4^{\circ}$. An examination of the data at $\theta = 0^{\circ}$ for the other Mach numbers shown in figure 6 indicates negligible crossflow effect at the longitudinal stations $s/l = 0.33$ and $s/l = 0.60$. The data presented for the flare ($s/l = 1.00$), however, show that some crossflow effect exists at the higher angles of attack at Mach numbers up to 2.96. A comparison of the theoretical method with the data of figure 6 indicates that the radial variation of C_p is accurately predicted in the regions where negligible crossflow effect is indicated (that is, above $M_{\infty} = 1.50$ for stations at $s/l = 0.33$ and $s/l = 0.60$, and above $M_{\infty} = 2.30$ and at small angles of attack for $s/l = 1.00$). Figures 6(a) and 6(b) indicate that the present method does not give good estimates of the pressures on the flare afterbody of model 2 when the flare shock is detached. The present theoretical method indicates that this condition occurs for all angles of attack at $M_{\infty} = 1.50$ and at the higher angles of attack as the Mach number increases. The poor agreement of the present method with experiment for these conditions is caused by the fact that the second-order shock-expansion method does not give a solution, and the less sophisticated embedded Newtonian theory must be used. In figure 6(a) at $M_{\infty} = 1.50$ and $\alpha = 12^{\circ}$, the theoretical curve for $s/l = 1.00$ exhibits two discontinuities as a result of the need to change theories. The curve from $\theta = 45^{\circ}$ to 90° represents a solution from the second-order shock-expansion theory. Equivalent bodies generated for values of θ below 45° have detached shock waves generated by the flare afterbody, and the embedded Newtonian theory is used from $\theta = 30^{\circ}$ to -45°. Below -45°, the equivalent bodies are rather blunt; therefore, the theoretical method uses only modified Newtonian theory and regards the stagnation region as extending over the entire equivalent bodies. An example of the relative shapes of the equivalent bodies for these conditions is shown in figure 2 at $\alpha = 12^{\circ}$. Figure 6 indicates several other conditions where the second-order shock-expansion theory is replaced by the embedded Newtonian theory to obtain the pressures on the flare afterbody. In general, the discontinuities at the higher Mach numbers are not nearly so large and the agreement with the experiment is much better than that for the condition where $M_{\infty} = 1.50$.

The longitudinal pressure distributions are presented for models 1 and 2 at $\alpha = 8^{\circ}$ in figures 7(a) and 7(b), respectively. The radial pressure distributions presented in

figure 6 indicated relatively smooth variations of the pressures with θ from -90° to 90°. The longitudinal distributions in figure 7 are presented for only three radial values: -90°, 0°, and 90°. In general, the theoretical methods in figure 7 are shown to be in good agreement with experiment for both models at $\alpha = 8^{\circ}$.

Forces and Moments

In order to obtain experimental values of the forebody forces and moments, the surface-pressure distributions of tables I to XII were integrated to provide the axial forces, normal forces, and pitching moments for models 1 and 2 at all test conditions. These force and moment data are presented in figure 8 along with the forces and moments provided by the present theoretical methods and by modified Newtonian methods. The modified Newtonian estimates were obtained from the program of reference 6 in which the stagnation-pressure coefficient was provided by the normal shock relations and the true body shape was used for the angle-of-attack conditions.

Figure 8(a) indicates that the force and moment coefficients predicted by the present theoretical method are generally in good agreement with the experimental data for model 1. Figure 8(b), however, indicates that significant discrepancies exist between the theoretical and experimental forces and moments at $M_{\infty} = 1.50$ for model 2. Also, figure 8(b) indicates that the theoretical predictions of the axial force are higher than the experimental values at the higher Mach numbers. Both of these discrepancies are due to the flow phenomenon associated with the flared afterbody. At $M_{\infty} = 1.50$, the flare of model 2 causes a theoretically detached shock wave, and, as previously discussed for the pressure distributions, the present method does not adequately evaluate this condition. At the higher Mach numbers, flow separation induced by the flare causes lower pressures on the flare and consequently a reduction in axial force, a condition which the present theory does not consider. The comparison of theory and experiment in figure 8 indicates that the present methods give adequate engineering estimates of the forces and moments on blunt bodies of revolution at small angles of attack except where large areas of flow separation exist or detached secondary shock waves are present.

The comparison of the present method with the modified Newtonian theory, as shown in figure 8, indicates that the accuracy with which the present method predicts axial force is not significantly better than that for modified Newtonian theory. The apparent overall accuracy of the Newtonian force and moment predictions is difficult to reconcile because of the large errors indicated in the Newtonian estimates for the surface-pressure distributions (fig. 5) and is consequently felt to be somewhat fortuitous.

CONCLUDING REMARKS

Existing theoretical techniques have been modified and combined to provide a method for computing surface-pressure distributions on blunt bodies with spherical nose caps and arbitrary afterbody shapes at small angles of attack. The method consists basically of modified Newtonian theory in the stagnation region with second-order shock-expansion theory used when the surface flow becomes supersonic. The second-order shock-expansion theory is most conveniently applied to rotationally symmetric bodies; therefore, to use this theory at small angles of attack, the body meridian lines are used to generate equivalent bodies of revolution from which the meridian pressure distributions are obtained.

A complete, consistent set of experimental surface-pressure data is presented for two typical blunt reentry configurations to permit evaluation of the present theoretical methods. The test conditions provide surface-pressure distributions for six Mach numbers from 1.50 to 4.63 and four angles of attack from 0° to 12° for each model. A comparison of the present theoretical method with these experimental data indicates that this method gives adequate engineering estimates of the surface pressures on blunt bodies at moderate angles of attack except where flow separation or detached secondary shock waves are present.

The experimental pressures were integrated to give forces and moments for the angle-of-attack range, and a comparison of the present theoretical method and modified Newtonian theory was made. In general, the present method did not show significantly better agreement with the experimental axial force than did the Newtonian theory. However, in the lower Mach number range, the present method generally showed improved agreement with the experimental normal force. As was the case with the surface pressures, the present method gave adequate engineering estimates of the forces and moments except where large areas of flow separation or detached secondary shock waves occurred.

The present theoretical method has been programed for high-speed digital computing. The resulting program provided a tool which can be used with a minimum of effort to provide theoretical estimates of surface pressures and forces for blunt bodies of revolution with arbitrary afterbody shapes such as flares and boattails. The demonstrated agreement with experiment for blunted cones with and without flares suggests a wide area of application for determining the aerodynamic characteristics of reentry and missile configurations in the supersonic-speed range.

Langley Research Center,
National Aeronautics and Space Administration,
Langley Station, Hampton, Va., June 24, 1968,
722-01-00-02-23.

APPENDIX

COMPUTER PROGRAM TO DETERMINE PRESSURE DISTRIBUTIONS AND FORCES ON BLUNT BODIES OF REVOLUTION

The process described in the text for obtaining the surface pressures along meridian lines of blunt bodies of revolution has been programed for high-speed digital computation. The computer program has been written to include the integration of the surface pressures in order to obtain the axial-force, normal-force, and pitching-moment coefficients. The purpose of this appendix is to provide a description of the necessary input and available output as well as a FORTRAN listing of the source program with an example input case and the resulting output listing.

DESCRIPTION OF PROGRAM

The program reads in the body geometry in terms of a spherical nose-cap radius and x,y coordinates starting at the point of tangency to the nose cap. The program then generates for the desired radial angles θ the equivalent bodies which represent the shape of the meridian lines of the body at the input angle of attack. The program represents the longitudinal shape of these bodies by straight-line elements between the transformed input coordinates. The spherical cap from the stagnation point to the tangency point is represented by 20 straight-line segments. After the equivalent bodies are obtained, the pressure distributions are computed and integrated along the respective meridian lines of the input body to obtain the forces and moments. By selecting output options, the pressure and Mach number variations for each meridian line can be obtained with the forces and moments or just the forces and moments can be output.

PROGRAM LISTING

The FORTRAN listing of the source program used at the NASA Langley Research Center on the Control Data 6600 computer system is presented as follows:

APPENDIX

```
      PROGRAM  BODY(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT)
C             PRINT OPTION    IPRINT=0    LONG PRINT OUT
C                             IPRINT=1    SHORT PRINT OUT
      DIMENSION WHAT(10),X(200),Y(200),XANS(200),PANS(200),AMANS(200),
     1CP(200),XS(200),YS(200),DEL(200),ANGLE(200),AM1T(200),THET1T(200),
     2PC(200),X1(200),Y1(200),XC(200),YC(200),YANS(200),
     3MTAB(10),DELTAT(50,10),PCT(50,10),A(4),TEMP(8),ROOT(3),S(200),
     4SOL(200),THETPL(10),XTABT(50,10),DELCPT(50,10),XTAB(50),R1(50,10),
     5CP1(50,10),CP2(50,10),THETA(20),ANSCA(20),AXT(50),YA(200),
     6XA(200),XXANS(200,20),CCP(200,20),R2(100),XTAB2(100)
      COMMON/BLK/NTHET,THETA,ANSCA,THETPL,DELCPT,R1,XX,XTAB,AXT,
     1XTABT,SS,LENGTH,J,YA,CCP,XA,XXANS,N,II,X1,CA,CN,CM,KSTOP3,
     2KSTOP2,KSTOP1,KKODE,R2
      REAL MIDDLE,LENGTH,MTAB
      COMPLEX TEMP,ROOT
      NAMELIST/NUM/DELTAT,MTAB,PCT,AM,N,X1,Y1,R,DELA,ALPH,THETPL,SS,
     1LENGTH,NTHET,IPRINT
    1 READ(5,2)WHAT
    2 FORMAT(12A6)
      WRITE(6,9)
    9 FORMAT(1H1)
      DO 13 KL=1,10
      DO 13 LK=1,50
      DELCPT(LK,KL)=0.
      XTABT(LK,KL)=0.
   13 R1(LK,KL)=0.
      READ(5,NUM)
      IF(IPRINT.EQ.0) WRITE(6,15) WHAT
   15 FORMAT(///1X,12A6//)
      XDEL=X1(N)/50.
      XDEL2=X1(N)/100.
      XTAB(1)=0.
      XTAB2(1)=0.
      DO 23 KL=2,50
   23 XTAB(KL)=XTAB(KL-1)+XDEL
      DO 44 KL=2,100
   44 XTAB2(KL)=XTAB2(KL-1)+XDEL2
      DO 3 LL=1,NTHET
      KODE=0
      THET=THETPL(LL)
      THETA(LL)=ABS(THETPL(LL))
      IJ=2*NTHET+1
```

APPENDIX

```
      THETA(IJ-LL)=-ABS(THETPL(LL))
 1001 IF(IPRINT.EQ.0) WRITE(6,6) AM,ALPH,THET
      IF(IPRINT.EQ.0) WRITE(6,7)
      AMA=0.
      THETR = THET * .017453293
      ALPHR = ALPH * .017453293
      IF(THETR.GT.0) GO TO 22
      ALPHR=-ALPHR
      THETR=-THETR
   22 DO 14 M = 1,N
      X(M) =  .((R * (COS(ALPHR) - 1.) + X1(M) + (Y1(M) * COS(ALPHR) -
     1(X1(M) - R) * SIN(ALPHR)) * SIN(ALPHR)) / COS(ALPHR) - X1(M))
     2* SIN(THETR) + X1(M)
   14 Y(M)=((Y1(M)*COS(ALPHR)-(X1(M)-R)*SIN(ALPHR))-Y1(M))
     1*SIN(THETR)+Y1(M)
      RR=(Y(1)**2+X(1)**2)/(2.*X(1))
      ALP=0.
      DO 50 K=1,19
      ALP=ASIN(Y(1)/RR)/20.+ALP
      XC(K)=RR-RR*COS(ALP)
   50 YC(K)=RR*SIN(ALP)
      DEL(1)=90.
      J=N+19
      DO 60 I=20,J
      XC(I)=X(I-19)
   60 YC(I)=Y(I-19)
      DO 20 I=2,J
   20 DEL(I)=57.295779*ATAN((YC(I)-YC(I-1))/(XC(I)-XC(I-1)))
      IF(IPRINT.EQ.0) WRITE(6,8)(XC(I),YC(I),DEL(I),I=1,J)
      IF(IPRINT.EQ.0) WRITE(6,10)
      PTOP=(6.*AM**2/5.)**3.5*(6./(7.*AM**2-1.))**2.5
      PSI=0
      DO30I=1,20
      XA(I)=RR-RR*COS(PSI-    (ALPHR)*SIN(THETR))
      YA(I)=RR*SIN(PSI-    (ALPHR)*SIN(THETR))
      PSI=PSI+ASIN(YC(20)/RR)/20.
   30 S(I)=(PSI-ALPHR*SIN(THETR))*RR
      J=N+20
      DO35I=21,J
      XA(I)=X1(I-20)
   35 YA(I)=Y1(I-20)
      K=J-1
      DO36I=21,K
```

```
 36  S(I)=SQRT((XA(I)-XA(I+1))**2+(YA(I)-YA(I+1))**2)+S(I-1)
     PANS(1)=PTOP
     CP(1)=(PANS(1)-1.)/(.7*AM**2)
     AMANS(1)=0.
     SOL(1)=S(1)/X1(N)
     DEL(1)=ATAN(YC(1)/XC(1))
     IF(IPRINT.EQ.0) WRITE(6,11)XA(1),PANS(1),AMANS(1),CP(1),YA(1),
    1SOL(1)
     DPDSA=0
     DELZ=DELA/57.295779
     J=N+19
     KEY=0
     KEY1=0
     XXANS(J,LL)=XA(1)
     CCP(J,LL)=CP(1)
     IF(YA(1).LT.0..AND.KODE.EQ.0.) XXANS(J,LL)=-ABS(XA(1))
     DO 200 I=2,J
     DEL(I)=ATAN((YC(I)-YC(I-1))/(XC(I)-XC(I-1)))
     IF(AMA.LT.1.) GO TO 260
     IF(DEL(I).GT.DELZ) GO TO 260
     KEY=1
     IF(DEL(I) .LT.0.) GO TO 501
     DELTA=DEL(I)
     CALL BILUP(DELTAT,MTAB,PCT,PCT,13,8,DELTA,AM,PC(I))
     GO TO 500
501  PC(I)=1.
500  ANUA=2.4495*ATAN(.40825*SQRT(AMA**2-1.))-ATAN(SQRT(AMA**2-1.))
     ANUB=ANUA+DEL(I-1)-DEL(I)
     IF(ANUB.GE.ANUA) GO TO 1000
C
C    CALCULATION FOR COMPRESSION AND SHOCK FORMATION
C
     ADELTA=DEL(I)-DEL(I-1)
     ANG=ADELTA
     A(1)=1.0
     A(2)=-(AMA**2+2.)/AMA**2-1.4*SIN(ANG)**2
     A(3)=(2.*AMA**2+1.)/AMA**4+(2.4**2/4.+.4/AMA**2)*SIN(ANG)**2
     A(4)=-COS(ANG)**2/AMA**4
     CALL FALG(A,3,0,ROOT,TEMP,IERR)
     AR1=REAL(ROOT(1))
     AI1=AIMAG(ROOT(1))
     AR2=REAL(ROOT(2))
     AI2=AIMAG(ROOT(2))
```

```
      AR3=REAL(ROOT(3))
      AI3=AIMAG(ROOT(3))
      IF(IERR) 94,95,94
   94 WRITE(6,96) ROOT
   96 FORMAT(15H  ERROR IN FALG/2X,6E17.8)
      GO TO 260
C
C     TEST TO FIND IMAGINARY ROOTS
C
   95 IF(ABS(AI1).LT..00001.AND.ABS(AI2).LT..00001.AND.ABS(AI3).LT.
     1.00001) GO TO 97
      WRITE(6,98)A(2),A(3),A(4),ROOT
   98 FORMAT(17H  IMAGINARY ROOTS,3E17.8/6E17.8)
      GO TO 260
C
C     CHECK FOR MIDDLE ROOT
C
   97 BIG=AMAX1(AR1,AR2,AR3)
      SMALL=AMIN1(AR1,AR2,AR3)
      DO 99 L=1,3
      IF(REAL(ROOT(L)).LT.BIG.AND.REAL(ROOT(L)).GT.SMALL) GO TO 91
   99 CONTINUE
      WRITE(6,92)ROOT
   92 FORMAT(17H  TWO EQUAL ROOTS/2X,6E17.8)
      GO TO 260
   91 MIDDLE=SQRT(REAL(ROOT(L)))
      SIGMA=ASIN(MIDDLE)
      SINSQ=SIN(SIGMA)**2
      AMB=SQRT((36.*AMA**4*SINSQ-5.*(AMA**2*SINSQ-1.)*(7.*AMA**2*SINSQ
     1+5.))/((7.*AMA**2*SINSQ-1.)*(AMA**2*SINSQ+5.)))
      PB=(7.*AMA**2*SINSQ-1.)/6.*PA
      AMUB=SIN(1./AMB)
      XX=(2.4*TAN(DEL(I)-DEL(I-1))*COS(SIGMA-DEL(I-1))-SIN(SIGMA-
     1DEL(I-1)))*AMA**2*SIN(SIGMA-DEL(I-1))**2+SIN(SIGMA-DEL(I-1))
      YY=1.+(1.-2.*SIN(SIGMA-DEL(I-1))**2+2.*TAN(DEL(I)-DEL(I-1))*
     1SIN(SIGMA-DEL(I-1))*COS(SIGMA-DEL(I-1)))*AMA**2*SIN(SIGMA-DEL(I-1
     2))**2
      F=4./2.4*(1.+.4/2.*AMA**2)*SIN(SIGMA-DEL(I-1))*XX/YY
      BA=1.4*PA*AMA**2/(2.*(AMA**2-1.))
      BB=1.4*PB*AMB**2/(2.*(AMB**2-1.))
      XY=2.*BB/(YC(I)-1.)*(SIN(SIGMA-DEL(I-1))*SIN(DEL(I-1))/
     1SIN(SIGMA-DEL(I))-SIN(DEL(I)))+DPDSA*(BB*SIN(SIGMA-DEL(I-1))/
     2(BA*SIN(SIGMA-DEL(I)))+(PB/PA-F)*COS(SIGMA-DEL(I-1))*TAN(AMUB)/
```

```
   3SIN(SIGMA-DEL(I)))
    DPDS=XY/(1.+TAN(AMUB)/TAN(SIGMA-DEL(I)))
    ETA=DPDS*(XC(I)-XC(I-1))/((PC(I)-PB)*COS(DEL(I)))
    IF(ETA)300,270,270
300 PANS(I)=PB
    AMANS(I)=AMB
    XANS(I)=(XA(I)+XA(I+1))/2.
    DPDSA=(PC(I)-PANS(I))/(S(J)-S(I))
    AMA=AMANS(I)
    PA=PANS(I)
    IF(IPRINT.EQ.0) WRITE(6,4)
    GO TO 280
1000 DELM=.01
    K=1
    AMB=AMA
210 AMB=AMB+DELM
    ANU=2.4495*ATAN(.40825*SQRT(AMB**2-1.))-ATAN(SQRT(AMB**2-1.))
    IF(ANU-ANUB)210,210,220
220 AMB=AMB-DELM
    GO TO (230,240,245,250),K
230 DELM=.001
    K=2
    GO TO 210
240 DELM=.0001
    K=3
    GO TO 210
245 DELM=.00001
    K=4
    GO TO 210
250 PB=PA*((1.+AMA**2/5.)/(1.+AMB**2/5.))**3.5
254 BA=1.4*PA*AMA**2/(2.*(AMA**2-1.))
    AOASTA=((125./216.)/AMA)*(1.+AMA**2/5.)**3
    BB=1.4*PB*AMB**2/(2.*(AMB**2-1.))
    AOASTB=((125./216.)/AMB)*(1.+AMB**2/5.)**3
    DPDS=(BB/YC(I-1))*(AOASTA/AOASTB*SIN(DEL(I-1))-SIN(DEL(I)))
   1+BB/BA*AOASTA/AOASTB*DPDSA
255 ETA=DPDS*(XC(I)-XC(I-1))/((PC(I)-PB)*COS(DEL(I)))
    IF(ETA)300,271,270
271 ETA=2.*ETANS
    GOTO 270
260 IF(IPRINT.EQ.0) WRITE(6,5)
    IF(KEY.EQ.0)GOTO261
    IF(KEY1.EQ.1)GOTO263
```

```
      KEY1=1
      PANS(I)=.7*AM**2*(CP(I-1)+(AM/AMANS(I-1))**2/PANS(I-1)*2.*SIN(DEL(
     1I))**2)+1.
      GOTO262
  263 PANS(I)=PANS(I-1)
      GOTO262
  261 PANS(I)=(PTOP-1.)*SIN(DEL(I))**2+1.
  262 AMANS(I)=SQRT(5.*((PANS(I)/PANS(I-1))**(-2./7.)*(1.+.2*
     1AMANS(I-1)**2)-1.))
      AMA=AMANS(I)
      PA=PANS(I)
      XANS(I)=(XA(I)+XA(I+1))/2.
      DPDSA=0.
      GO TO 280
  270 PA=PC(I)-(PC(I)-PB)*EXP(-ETA)
      AMA=SQRT(5.*((1.+AMB**2/5.)*(PB/PA)**.28571-1.))
      XANS(I)=(XA(I)+XA(I+1))/2.
      ETANS=ETA/2.
      PANS(I)=PC(I)-(PC(I)-PB)*EXP(-ETANS)
      AMANS(I)=SQRT(5.*((1.+AMB**2/5.)*(PB/PANS(I))**.28571-1.))
      DPDSA=(PC(I)-PA)/(PC(I)-PB)*DPDS
  280 CP(I)=(PANS(I)-1.)/(AM**2*.7)
      YANS(I)=(YA(I)+YA(I+1))/2.
      SOL(I)=(S(I)+S(I-1))/(2.*X1(N))
      IF(KODE.EQ.0.) XXANS(J+I-1,LL)=XANS(I)
      IF(YANS(I).LT.0..AND.KODE.EQ.0.) XXANS(J+I-1,LL)=-ABS(XANS(I))
      IF(KODE.NE.1) GO TO 16
      XXANS(J-I+1,LL)=-ABS(XANS(I))
      CCP(J-I+1,LL)=CP(I)
      GO TO 200
   16 CCP(J+I-1,LL)=CP(I)
  200 IF(IPRINT.EQ.0) WRITE(6,11)XANS(I),PANS(I),AMANS(I),CP(I),YANS(I),
     1SOL(I)
      IF(KODE.EQ.1) GO TO 333
      KODE=1
      THET=-THET
      GO TO 1001
  333 DO 222 JJ=1,50
      J=N+20
      CALL FTLUP(XTAB(JJ),R1(JJ,LL),+1,J,XA,YA)
      JK=2*(N+19)-1
      CALL FTLUP(XTAB(JJ),CP1(JJ,LL),+1,JK,XXANS(1,LL),CCP(1,LL))
      CALL FTLUP(-XTAB(JJ),CP2(JJ,LL),+1,JK,XXANS(1,LL),CCP(1,LL))
      DELCPT(JJ,LL)=CP2(JJ,LL)-CP1(JJ,LL)
```

```
 222 XTABT(JJ,LL)=XTAB(JJ)
     DO 45 JJ=1,100
     J=N+20
  45 CALL FTLUP(XTAB2(JJ),R2(JJ),+1,J,XA,YA)
   3 CONTINUE
     J=N+19
     KK=1
     DO 610 KJ=1,J
     IF(YA(KJ).EQ.YA(KJ+1)) GO TO 610
     KK=KK+1
     YA(KK)=YA(KJ+1)
     XA(KK)=XA(KJ+1)
 610 CONTINUE
     KSTOP1=0
     KSTOP2=0
     KSTOP3=0
     J=KK-1
     DO 6000 KK1=1,J
     IF(YA(KK1+1).GT.YA(KK1)) GO TO 6000
     KSTOP1=KK1
     DO  6001 KK2=KK1,J
     IF(YA(KK2+1).LT.YA(KK2)) GO TO 6001
     KSTOP2=KK2
     DO 6002 KK3=KK2,J
     IF(YA(KK3+1).GT.YA(KK3)) GO TO 6002
     KSTOP3=KK3
6002 CONTINUE
     KSTOP3=J+1
     GO TO 6003
6001 CONTINUE
     KSTOP2=J+1
     GO TO 6003
6000 CONTINUE
     KSTOP1=J+1
6003 CALL FORCES
     IF(IPRINT.NE.0) WRITE(6,1004) WHAT
1004 FORMAT(///1X10A6///)
     IF(IPRINT.NE.0) WRITE(6,1005) AM,ALPH,CA,CN,CM
1005 FORMAT(10X2HM=F6.2,7X6HALPHA=F6.2,7X3HCA=F8.5,7X3HCN=F8.5,
    17X3HCM=F8.5)
     IF(IPRINT.EQ.0) WRITE(6,1003)CA,CN,CM
1003 FORMAT(10X3HCA=F8.5,7X3HCN=F8.5,7X3HCM=F8.5//)
      GO TO 1
```

```
 4 FORMAT(1X19H1ST ORDER SHOCK-EXP)
 5 FORMAT(1X9HNEWTONIAN)
 6 FORMAT(//32X14HINPUT      DATA///,22X2HM=F8.2,3X6HALPHA=F8.2,
  13X6HTHETA=F8.2//)
12 FORMAT(27X19HSTARTING CONE -  M=F8.5,4X6HTHETA=F8.3///)
 7 FORMAT(24X1HX,14X1HY,14X5HDELTA//)
 8 FORMAT(20XF8.4,7XF8.4,7XF8.4)
10 FORMAT(////36X6HOUTPUT///,11X1HX,9X4HP/P0,8X1HM,10X2HCP,10X1HY,
  110X3HS/L)
11 FORMAT(7X,F8.4,3X,F9.5,3X,F7.4,3X,F7.4,4X,2X,F10.6,2X,F10.6)
   END
```

```
      SUBROUTINE FORCES
      DIMENSION THETPL(10),XTABT(50,10),DELCPT(50,10),XTAB(50),
     1R1(50,10),CP1(50,10),CP2(50,10),THETA(20),ANSCA(20),
     2AXT(50),YA(200),XA(200),XXANS(200,20),CCP(200;20),FOCNCM(2),
     3CNCM(2),FOFR(2),ANS3(2),X1(200),R2(100)
      COMMON/BLK/NTHET,THETA,ANSCA,THETPL,DELCPT,R1,XX,XTAB,AXT,
     1XTABT,SS,LENGTH,J,YA,CCP,XA,XXANS,N,II,X1,CA,CN,CM,KSTOP3,
     2KSTOP2,KSTOP1,KKODE;R2
      REAL LENGTH
      EXTERNAL FUNA,FUNC,FUNCN,FUCNCM
      DO 1 I=1,NTHET
      SUM1=0.
      SUM2=0.
      A1=0.
      ICODE=1
      DO 3 JJ=2,100
      B1=R2(JJ)
      IF(((B1.GE.(A1+.0000000001)).OR.(B1.GE.(A1-.0000000001))).AND.
     1ICODE.EQ.1) GO TO 11
      IF(((B1.GE.(A1+.0000000001)).OR.(B1.GE.(A1-.0000000001))).AND.
     1ICODE.EQ.2) GO TO 12
      ICODE=2
      KKODE=2
      GO TO 13
   11 KKODE=1
      GO TO 13
   12 KKODE=3
   13 II=I
      CALL MGAUSS(A1,B1,2,ANS3,FUNA,FOFR,2)
      SUM1=SUM1+ANS3(1)
      SUM2=SUM2+ANS3(2)
    3 A1=B1
      ANSCA(I)=SUM1
      IJ=2*NTHET+1
    1 ANSCA(IJ-I)=SUM2
      KK=2*NTHET
      SUMCA=0.
    4 A=THETA(KK)
      B=THETA(KK-1)
      CALL MGAUSS(A,B,2,CA1,FUNC,FOFO,1)
      SUMCA=SUMCA+CA1
      KK=KK-1
```

```
      IF(KK.EQ.(NTHET+1))KK=KK-1
      IF((KK-1).LT.1) GO TO 6
      GO TO 4
    6 CA=SUMCA/57.2958
      AXT(1)=0.
      DO 7 L=2,50
      SUM1=0.
      K=NTHET
      XX=XTAB(L)
    8 A=THETA(K)
      B=THETA(K-1)
      CALL MGAUSS(A,B,1,ANSCN,FUNCN,FOFCN,1)
      SUM1=SUM1+ ANSCN
      IF(THETA(K-1).EQ.90.) GO TO 7
      K=K-1
      GO TO 8
    7 AXT(L)=SUM1
      A=0.
      B=X1(N)
      CALL MGAUSS(A,B,10,CNCM,FUCNCM,FOCNCM,2)
      CN=2.*CNCM(1)/(SS*57.2958)
      CM=-2.*CNCM(2)/(SS*LENGTH*57.2958)
      RETURN
      END
```

```
      SUBROUTINE  FUNA(RT,FOFR)
      DIMENSION THETPL(10),XTABT(50,10),DELCPT(50,10),XTAB(50),
     1R1(50,10),CP1(50,10),CP2(50,10),THETA(20),ANSCA(20),
     2AXT(50),YA(200),XA(200),XXANS(200,20),CCP(200,20),FOFR(2)
     3,X1(200),R2(100)
      COMMON/BLK/NTHET,THETA,ANSCA,THETPL,DELCPT,R1,XX,XTAB,AXT,
     1XTABT,SS,LENGTH,J,YA,CCP,XA,XXANS,N,II,X1,CA,CN,CM,KSTOP3,
     2KSTOP2,KSTOP1,KKODE,R2
      GO TO(6009,6005,6004),KKODE
 6009 CALL FTLUP(RT,XTT,+1,KSTOP1,YA,XA)
      GO TO 6006
 6005 KSTOP=KSTOP2-KSTOP1+1
      CALL FTLUP(RT,XTT,-1,KSTOP,YA(KSTOP1),XA(KSTOP1))
      GO TO 6006
 6004 KSTOP=KSTOP3-KSTOP2+1
      CALL FTLUP(RT,XTT,+1,KSTOP,YA(KSTOP2),XA(KSTOP2))
 6006 J=2*(N+19)-1
      CALL FTLUP(XTT,CPT,+1,J,XXANS(1,II),CCP(1,II))
      CALL FTLUP(-XTT,CPTM,+1,J,XXANS(1,II),CCP(1,II))
 6007 FOFR(1)=CPT*RT*2./SS
      FOFR(2)=CPTM*RT*2./SS
      RETURN
      END
```

```
      SUBROUTINE  FUNCN(THECN,FOFCN)
      DIMENSION THETPL(10),XTABT(50,10),DELCPT(50,10),XTAB(50),
     1R1(50,10),CP1(50,10),CP2(50,10),THETA(20),ANSCA(20),
     2AXT(50),YA(200),XA(200),XXANS(200,20),CCP(200,20),X1(200)
     3,R2(100)
      COMMON/BLK/NTHET,THETA,ANSCA,THETPL,DELCPT,R1,XX,XTAB,AXT,
     1XTABT,SS,LENGTH,J,YA,CCP,XA,XXANS,N,II,X1,CA,CN,CM,KSTOP3,
     2KSTOP2,KSTOP1,KKODE,R2
      CALL BILUP(XTABT,THETPL,DELCPT,R1,50,NTHET,XX,THECN,DELCP,RCN)
      FOFCN=DELCP*RCN*SIN(THECN/57.2958)
      RETURN
      END
```

APPENDIX

```
      SUBROUTINE FUNC(THE2,FOFO)
      DIMENSION THETPL(10),XTABT(50,10),DELCPT(50,10),XTAB(50),
     1R1(50,10),CP1(50,10),CP2(50,10),THETA(20),ANSCA(20),
     2AXT(50),YA(200),XA(200),XXANS(200,20),CCP(200,20),X1(200)
     3,R2(100)
      COMMON/BLK/NTHET,THETA,ANSCA,THETPL,DELCPT,R1,XX,XTAB,AXT,
     1XTABT,SS,LENGTH,J,YA,CCP,XA,XXANS,N,II,X1,CA,CN,CM,KSTOP3,
     2KSTOP2,KSTOP1,KKODE,R2
      NN=2*NTHET
      CALL FTLUP(THE2,CPRR,-1,NN,THETA,ANSCA)
      FOFO=CPRR
      RETURN
      END
```

```
      SUBROUTINE FUCNCM(DX,FOCNCM)
      DIMENSION THETPL(10),XTABT(50,10),DELCPT(50,10),XTAB(50),
     1R1(50,10),CP1(50,10),CP2(50,10),THETA(20),ANSCA(20),
     2AXT(50),YA(200),XA(200),XXANS(200,20),CCP(200,20),FOCNCM(2),
     3R2(100),X1(200)
      COMMON/BLK/NTHET,THETA,ANSCA,THETPL,DELCPT,R1,XX,XTAB,AXT,
     1XTABT,SS,LENGTH,J,YA,CCP,XA,XXANS,N,II,X1,CA,CN,CM,KSTOP3,
     2KSTOP2,KSTOP1,KKODE,R2
      CALL FTLUP(DX,AXX,1,50,XTAB,AXT)
      FOCNCM(1)=AXX
      FOCNCM(2)=AXX*DX
      RETURN
      END
```

```
      SUBROUTINE BILUP(TABI,TABJ,TABIJ,TACIJ,NI,NJ,VALI,VALJ,BVAL1,
     1CVAL1)
C     A TWO DIMENSIONAL TABLE LOOK-UP FOR TWO VARIABLES.
C     INPUT TABLES ARE - TABIJ(I,J) AND TAGIJ(I,J) AS FUNCTIONS OF
C     TABI(I) AND TABJ(J).  THE TWO DEPENDENT VARIABLES ARE LINEARLY
C     INTERPOLATED SIMULTANEOUSLY FOR INPUT VALUES OF VALI AND VALJ
C     RESULTING IN ANSWERS BVAL1 AND CVAL1.
C     ERROR SIGNALS ARE GENERATED WHEN THE TABJ(J) TABLE IS EXTRAPOLATED.
      DIMENSION TABJ(10),TABI(50,10),TABIJ(50,10),TACIJ(50,10),TBISL(2),
     1TBIJ1(2),TCIJ1(2)
      TBJSL=0.0
      KK=2
      IF(TABJ(1).LT.TABJ(2)) GO TO 1
      DO 10 J=1,NJ
      IF(VALJ-TABJ(J)) 10,9,11
    9 TBJSL=1.0
      GO TO 300
   10 CONTINUE
      IF(J.EQ.NJ) WRITE(6,100)
  100 FORMAT(/20X20HHIGH J EXTRAPOLATION)
   11 IF(J.GT.1) GO TO 300
      WRITE(6,101)
  101 FORMAT(/20X19HLOW J EXTRAPOLATION)
      J=2
      GO TO 300
    1 DO 2 J=1,NJ
      IF(VALJ-TABJ(J))3,4,2
    4 TBJSL=1.0
      GO TO 300
    2 CONTINUE
      IF(J.EQ.NJ) WRITE(6,100)
    3 IF(J.GT.1) GO TO 300
      WRITE(6,101)
      J=2
  300 IF(TABI(1,J).GT.TABI(2,J)) GO TO 5
      IF(VALI.LT.TABI(1,J)) GO TO 21
      IF(VALI.GT.TABI(NI,J)) GO TO 24
      DO 20 I=1,NI
      IF(VALI-TABI(I,J)) 22,28,20
   20 CONTINUE
   21 I=2
      GO TO 22
```

```
24 I=NI
   GO TO 22
 5 IF(VALI.GT.TABI(1,J)) GO TO 6
   IF(VALI.LT.TABI(NI,J)) GO TO 7
   DO 8 I=1,NI
   IF(VALI-TABI(I,J)) 8,28,22
 8 CONTINUE
 6 I=2
   GO TO 22
 7 I=NI
   GO TO'22
28 TBISL(KK)=0.0
   TBIJ1(KK)=TABIJ(I,J)
   TCIJ1(KK)=TACIJ(I,J)
   GO TO 29
22 TBISL(KK)=(VALI-TABI(I-1,J))/(TABI(I,J)-TABI(I-1,J))
   TBIJ1(KK)=TBISL(KK)*(TABIJ(I,J)-TABIJ(I-1,J))+TABIJ(I-1,J)
   TCIJ1(KK)=TBISL(KK)*(TACIJ(I,J)-TACIJ(I-1,J))+TACIJ(I-1,J)
29 IF(TBJSL.EQ.0.0) GO TO 26
   BVAL1=TBIJ1(KK)
   CVAL1=TCIJ1(KK)
   GO TO 25
26 IF(KK.EQ.1) GO TO 23
   KK=KK-1
   J=J-1
   GO TO 300
23 J=J+1
   TBJSL=(VALJ-TABJ(J-1))/(TABJ(J)-TABJ(J-1))
   BVAL1=TBJSL*(TBIJ1(2)-TBIJ1(1))+TBIJ1(1)
   CVAL1=TBJSL*(TCIJ1(2)-TCIJ1(1))+TCIJ1(1)
25 RETURN
   END
```

APPENDIX

DESCRIPTION OF INPUT DATA

A single case consists of the determination of the surface pressures along a specified number of meridian lines running from the stagnation point to the base of the model. It is necessary to input, in addition to the body geometry, a table of cone surface pressures for a range of Mach numbers and cone half-angles, as well as the flow conditions, and angle of attack. For the loading routine used in the program, any column except the first may be used on the input cards unless otherwise specified, and a decimal format is used for the input quantities unless a fixed-point number is specified. A description of the required inputs along with the name used by the source program is given as follows:

INPUT NUMBER	NAME	DESCRIPTION
1	WHAT	Identification card; any identifying information may be written on this card and will appear at start of output for each case (columns 1 to 72)
2	$NUM	Arbitrary name required by loading routine to define block of input data (columns 2 to 5)
3	MTAB(1)	Mach number array for cone surface-pressure tables
4	DELTAT(1,1)	Cone half-angle array for cone surface-pressure tables, radians
5	PCT(1,1)	Cone surface-pressure array, p_c/p_∞
6	ALPH	Angle of attack, degrees
7	NTHET	Number of meridian lines to be considered in one quadrant (fixed-point number) 10 points maximum
8	THETPL(1)	Array of radial angles defining meridian lines in one quadrant, degrees
9	IPRINT	Print control, IPRINT = 0 output pressure and Mach number distributions for each meridian line and force data, IPRINT = 1 output only force data (fixed-point number)
10	R	Radius of spherical nose cap of body, model units
11	N	Number of body coordinates specified (fixed-point number) 100 points maximum
12	X1(1)	x-coordinate array, model units
13	Y1(1)	y-coordinate array, model units
14	SS	Reference area, model units squared
15	LENGTH	Reference length, model units
16	AM	Free-stream Mach number
17	DELA	Angle of body surface defining point at which modified Newtonian theory is matched to second-order shock-expansion theory, degrees
18	$	Denotes end of case (column 2)

APPENDIX

The system loading subroutine used in the program (NAMELIST) is quite flexible in that the order of the input cards is unimportant and successive cases can be run by repeating the identification and $NUM cards followed by only the changed parameters and a $ card. As an example of a set of input cards, the following is a listing of the inputs necessary to compute the surface pressures on model 2 at a Mach number of 2.30 and at an angle of attack of 4° with another case at an angle of attack of 8°:

SAMPLE INPUT

```
     1ST EXAMPLE CASE *** MODEL  2  - PRESSURE AND FORCE DATA
$NUM
 MTAB(1)=1.5,2.,2.5,3.,3.5,4.,4.5,5.,2*0.,
   DELTAT(1,1)=0.,.04363323,.08726645,.13089967,.1745329,.2181661,.2617993,
          .3054325,.3490658,.392699,.4363322,.479965,.5235987,
 37*0.,
            0.,.04363323,.08726645,.13089967,.1745329,.2181661,.2617993,
          .3054325,.3490658,.392699,.4363322,.479965,.5235987,
 37*0.,
            0.,.04363323,.08726645,.13089967,.1745329,.2181661,.2617993,
          .3054325,.3490658,.392699,.4363322,.479965,.5235987,
 37*0.,
            0.,.04363323,.08726645,.13089967,.1745329,.2181661,.2617993,
          .3054325,.3490658,.392699,.4363322,.479965,.5235987,
 37*0.,
            0.,.04363323,.08726645,.13089967,.1745329,.2181661,.2617993,
          .3054325,.3490658,.392699,.4363322,.479965,.5235987,
 37*0.,
            0.,.04363323,.08726645,.13089967,.1745329,.2181661,.2617993,
          .3054325,.3490658,.392699,.4363322,.479965,.5235987,
 37*0.,
            0.,.04363323,.08726645,.13089967,.1745329,.2181661,.2617993,
          .3054325,.3490658,.392699,.4363322,.479965,.5235987,
 37*0.,
            0.,.04363323,.08726645,.13089967,.1745329,.2181661,.2617993,
          .3054325,.3490658,.392699,.4363322,.479965,.5235987,
 137*0.,
 PCT(1,1)=1.,1.0194326,1.0624668,1.1218836,1.1949823,1.2805338,1.3780493,
          1.4875334,1.6094921,1.7452173,1.8977323,1.,1.,
 37*0.,
       1.,1.0302014,1.095048,1.1836274,1.2924832,1.4202392,1.5662549,
          1.73013,1.9114873,2.1099574,2.325245,2.5572482,2.8063347,
 37*0.,
       1.,1.0430054,1.1338127,1.2579479,1.4118223,1.5943908,1.8051591,
          2.0435503,2.3088209,2.5999833,2.9158958,3.2553311,3.6170774,
 37*0.,
       1.,1.0575531,1.1779135,1.3434709,1.5510936,1.8002508,2.0905385,
          2.4211572,2.7908532,3.1979721,3.6405103,4.1162105,4.6226939,
 37*0.,
       1.,1.07368,1.2270211,1.4399168,1.7101605,2.0377458,2.4222429,
          2.8624798,3.3565651,3.9019948,4.4957647,5.1344738,5.8144615,
 37*0.,
       1.,1.0912720,1.2809867,1.547292,1.8892065,2.3071757,2.8006264,
          3.3678429,4.0061275,4.7119593,5.4811532,6.3089994,7.1904022,
 37*0.,
       1.,1.1102609,1.3397531,1.6656866,2.0884875,2.6089172,3.2261054,
          3.9376627,4.7398834,5.6280810,6.5967119,7.6395491,8.7499419,
 37*0.,
       1.,1.1305848,1.403315,1.7952468,2.308246,2.9432816,3.6990542,
          4.5722872,5.558163,6.6506071,7.8425504,9.1261264,10.492909,
 137*0.,

 IPRINT=0,
 ALPH=4.,
AM=2.3,
DELA=27.,
R=1.8,
 SS=38.5,
 LENGTH=11.2,
NTHET=5,
 THETPL(1)=90.,67.5,45.,22.5,0.,5*0.,
N =21,
X1(1)=.687717,.8,.9,1.,1.2,1.4,1.6,1.8,2.,2.2,2.4,3.,4.,5.,6.,7.,7.6,8.,
     9.0,10.0,11.2,
Y1(1)=1.410216,1.494496,1.562926,1.62566,1.735586,1.826796,1.901084,1.95974,
     2.00373,2.033676,2.05000,2.0788461,2.126923,2.174999,2.223077,2.2711537,
     2.3,2.43384,2.76844,3.10304,3.50456,
$
     2ND EXAMPLE CASE *** MODEL  2  - FORCE DATA
$NUM
 IPRINT=1,
 ALPH=8.,
$
```

APPENDIX

The input cone surface pressures and their independent arrays (input numbers 3, 4, and 5) were obtained from reference 7, and need not be changed from case to case unless better coverage is desired. The present coverage includes cone half-angles from 0° to 30° by 2.5° intervals and Mach numbers from 1.50 to 5.00 by increments of 0.50.

DESCRIPTION OF OUTPUT

One of the first operations performed by the program is to transform for each radial angle the body geometry into the equivalent body coordinates in the wind-axis system and to compute local inclination to the free-stream velocity vector. For convenience, the items are listed under "INPUT DATA" on the output printing along with the free-stream Mach number, angle of attack in degrees, and radial angle in degrees. Listed under "OUTPUT" are the calculated Mach numbers and pressure coefficients for the midpoints of the elements of the equivalent body along with the body-axis coordinates of these points. The notation "NEWTONIAN" or "1ST ORDER SHOCK-EXP" indicates the theory used by the program to obtain the conditions on the next element.

After the program has cycled through the complete range of radial angles for the first and fourth quadrants, the force and moment coefficients are listed and a case is complete. A listing of only the force and moment coefficients can be obtained for each case by setting IPRINT = 1 on the input cards. An output listing is presented for the example input cases of the previous section where the surface pressures and forces are presented for the first case and the forces only are presented for the second.

APPENDIX

1ST EXAMPLE CASE *** MODEL 2 - PRESSURE AND FORCE DATA

INPUT DATA

M= 2.30 ALPHA= 4.00 THETA= 90.00

X	Y	DELTA
.0021	.0874	90.0000
.0085	.1747	85.8021
.0192	.2615	83.0034
.0341	.3477	80.2048
.0532	.4331	77.4062
.0764	.5174	74.6075
.1037	.6005	71.8089
.1350	.6822	69.0103
.1703	.7622	66.2116
.2094	.8405	63.4130
.2524	.9167	60.6144
.2990	.9907	57.8158
.3491	1.0624	55.0171
.4027	1.1315	52.2185
.4596	1.1980	49.4199
.5197	1.2615	46.6212
.5828	1.3221	43.8226
.6488	1.3795	41.0240
.7175	1.4337	38.2253
.7888	1.4844	35.4267
.9067	1.5606	32.8920
1.0112	1.6219	30.3838
1.1153	1.6775	28.1017
1.3225	1.7732	24.7945
1.5284	1.8502	20.5154
1.7331	1.9104	16.3770
1.9367	1.9550	12.3454
2.1393	1.9849	8.4047
2.3409	2.0008	4.5156
2.5415	2.0032	.6661
3.1421	1.9901	-1.2475
4.1430	1.9683	-1.2475
5.1439	1.9465	-1.2476
6.1448	1.9247	-1.2475
7.1458	1.9029	-1.2475
7.7463	1.8898	-1.2475
8.1547	1.9954	14.5002
9.1756	2.2594	14.5002
10.1965	2.5235	14.5002
11.4216	2.8403	14.5002

APPENDIX

OUTPUT

X	P/PO	M	CP	Y	S/L
.0044	7.29368	0.0000	1.6996	-.124937	-.003353
NEWTONIAN					
.0005	7.25995	.0814	1.6905	.006186	.000552
NEWTONIAN					
.0030	7.20030	.1358	1.6744	.093602	.008364
NEWTONIAN					
.0097	7.11152	.1904	1.6504	.180794	.016175
NEWTONIAN					
.0206	6.99447	.2454	1.6188	.267555	.023986
NEWTONIAN					
.0358	6.85027	.3007	1.5799	.353678	.031797
NEWTONIAN					
.0552	6.68029	.3565	1.5340	.438957	.039608
NEWTONIAN					
.0787	6.48615	.4129	1.4815	.523189	.047419
NEWTONIAN					
.1063	6.26971	.4699	1.4231	.606174	.055230
NEWTONIAN					
.1379	6.03302	.5278	1.3592	.687712	.063041
NEWTONIAN					
.1734	5.77834	.5865	1.2904	.767610	.070852
NEWTONIAN					
.2128	5.50811	.6463	1.2174	.845676	.078664
NEWTONIAN					
.2560	5.22489	.7071	1.1409	.921726	.086475
NEWTONIAN					
.3028	4.93139	.7691	1.0617	.995577	.094286
NEWTONIAN					
.3532	4.63042	.8325	.9804	1.067052	.102097
NEWTONIAN					
.4070	4.32483	.8974	.8979	1.135983	.109908
NEWTONIAN					
.4642	4.01754	.9637	.8149	1.202204	.117719
NEWTONIAN					
.5244	3.71149	1.0318	.7322	1.265557	.125530
NEWTONIAN					
.5877	3.40959	1.1015	.6507	1.325891	.133341
NEWTONIAN					
.6539	3.11472	1.1730	.5711	1.382751	.141152
NEWTONIAN					
.7439	2.85608	1.2393	.5012	1.452356	.151326
NEWTONIAN					
.8500	2.61007	1.3063	.4348	1.528711	.163003
NEWTONIAN					
.9500	2.39642	1.3682	.3771	1.594293	.173682
1.1000	2.04285	1.4807	.2816	1.680623	.189141
1.3000	1.66210	1.6215	.1788	1.781191	.209142
1.5000	1.35680	1.7563	.0964	1.863940	.228480
1.7000	1.10685	1.8892	.0289	1.930412	.247309
1.9000	.90068	2.0221	-.0268	1.981735	.265756
2.1000	.72900	2.1575	-.0732	2.018703	.283926
2.3000	.58619	2.2968	-.1118	2.041838	.301912
2.7000	.53825	2.3514	-.1247	2.064423	.337687
3.5000	.57444	2.3098	-.1149	2.102885	.409198
4.5000	.61598	2.2652	-.1037	2.150961	.498587
5.5000	.65381	2.2271	-.0935	2.199038	.587976
6.5000	.68820	2.1943	-.0842	2.247115	.677365
7.3000	.71340	2.1713	-.0774	2.285577	.748876
7.8000	1.67446	1.5737	.1821	2.366920	.794523
8.5000	1.67264	1.5745	.1816	2.601140	.860429
9.5000	1.67264	1.5745	.1816	2.935740	.954580
10.6000	1.67264	1.5745	.1816	3.303800	1.058146

APPENDIX

INPUT DATA

M= 2.30 ALPHA= 4.00 THETA= -90.00

X	Y	DELTA
.0016	.0749	90.0000
.0063	.1497	86.3986
.0141	.2242	83.9977
.0251	.2983	81.5967
.0391	.3719	79.1958
.0562	.4448	76.7948
.0764	.5170	74.3939
.0995	.5883	71.9930
.1257	.6585	69.5920
.1547	.7275	67.1911
.1866	.7953	64.7902
.2213	.8617	62.3892
.2588	.9266	59.9883
.2990	.9898	57.5874
.3418	1.0514	55.1864
.3871	1.1110	52.7855
.4348	1.1687	50.3845
.4850	1.2244	47.9836
.5374	1.2779	45.5827
.5921	1.3292	43.1817
.6982	1.4211	40.8920
.7932	1.4963	38.3838
.8885	1.5659	36.1017
1.0804	1.6895	32.7945
1.2735	1.7944	28.5154
1.4679	1.8825	24.3770
1.6633	1.9550	20.3454
1.8597	2.0128	16.4047
2.0572	2.0566	12.5156
2.2555	2.0869	8.6661
2.8521	2.1575	6.7525
3.8463	2.2752	6.7525
4.8405	2.3929	6.7524
5.8347	2.5106	6.7525
6.8289	2.6284	6.7525
7.4254	2.6990	6.7525
7.8151	2.8604	22.5002
8.7893	3.2639	22.5002
9.7636	3.6675	22.5002
10.9326	4.1517	22.5002

OUTPUT

X	P/PO	M	CP	Y	S/L
.0044	7.29368	0.0000	1.6996	.124730	.017836
NEWTONIAN					
.0161	7.26885	.0698	1.6929	.236476	.021181
NEWTONIAN					
.0276	7.22486	.1165	1.6810	.310500	.027871
NEWTONIAN					
.0421	7.15927	.1632	1.6633	.383979	.034561
NEWTONIAN					
.0597	7.07253	.2102	1.6399	.456784	.041251
NEWTONIAN					
.0804	6.96525	.2574	1.6109	.528786	.047941
NEWTONIAN					
.1040	6.83819	.3049	1.5766	.599861	.054631
NEWTONIAN					
.1306	6.69223	.3528	1.5372	.669882	.061321
NEWTONIAN					
.1602	6.52841	.4011	1.4930	.738727	.068011
NEWTONIAN					
.1925	6.34787	.4499	1.4442	.806275	.074701
NEWTONIAN					
.2277	6.15188	.4992	1.3913	.872407	.081391
NEWTONIAN					
.2656	5.94181	.5492	1.3345	.937008	.088081
NEWTONIAN					
.3062	5.71915	.5998	1.2744	.999964	.094771
NEWTONIAN					
.3494	5.48544	.6512	1.2113	1.061164	.101461
NEWTONIAN					
.3951	5.24234	.7034	1.1456	1.120501	.108151
NEWTONIAN					
.4433	4.99155	.7565	1.0779	1.177870	.114841
NEWTONIAN					
.4938	4.73483	.8105	1.0086	1.233172	.121531
NEWTONIAN					
.5466	4.47398	.8656	.9382	1.286308	.128221
NEWTONIAN					
.6016	4.21084	.9218	.8671	1.337187	.134911
NEWTONIAN					
.6587	3.94725	.9792	.7959	1.386133	.141601
NEWTONIAN					
.7439	3.69714	1.0350	.7284	1.452356	.151213
NEWTONIAN					
.8500	3.42653	1.0975	.6553	1.528711	.162890
NEWTONIAN					
.9500	3.18504	1.1556	.5901	1.594293	.173570
NEWTONIAN					
1.1000	2.84632	1.2419	.4986	1.680623	.189028
NEWTONIAN					
1.3000	2.43436	1.3569	.3874	1.781191	.209030
1.5000	1.99252	1.4980	.2680	1.863940	.228368
1.7000	1.64027	1.6304	.1729	1.930412	.247197
1.9000	1.35139	1.7590	.0949	1.981735	.265644
2.1000	1.10992	1.8874	.0297	2.018703	.283814
2.3000	.90714	2.0175	-.0251	2.041838	.301800
2.7000	.83454	2.0710	-.0447	2.064423	.337575
3.5000	.87347	2.0418	-.0342	2.102885	.409086
4.5000	.91525	2.0118	-.0229	2.150961	.498475
5.5000	.95047	1.9875	-.0134	2.199038	.587864
6.5000	.98024	1.9676	-.0053	2.247115	.677253
7.3000	1.00092	1.9542	.0002	2.285577	.748764
1ST ORDER SHOCK-EXP					
7.8000	2.27648	1.3661	.3447	2.366920	.794411
8.5000	2.29493	1.3603	.3497	2.601140	.860316
9.5000	2.32420	1.3511	.3576	2.935740	.954468
10.6000	2.34586	1.3444	.3635	3.303800	1.058034

APPENDIX

INPUT DATA

M= 2.30 ALPHA= 4.00 THETA= 67.50

X	Y	DELTA
.0021	.0870	90.0000
.0084	.1737	85.8234
.0190	.2601	83.0389
.0337	.3458	80.2545
.0526	.4307	77.4701
.0756	.5146	74.6857
.1026	.5973	71.9012
.1336	.6786	69.1168
.1685	.7583	66.3324
.2073	.8362	63.5479
.2498	.9121	60.7635
.2959	.9858	57.9791
.3455	1.0573	55.1947
.3986	1.1262	52.4102
.4550	1.1925	49.6258
.5145	1.2559	46.8414
.5770	1.3164	44.0570
.6424	1.3738	41.2725
.7105	1.4280	38.4881
.7811	1.4787	35.7037
.8986	1.5556	33.1963
1.0028	1.6174	30.6881
1.1066	1.6736	28.4060
1.3132	1.7703	25.0988
1.5186	1.8485	20.8196
1.7230	1.9097	16.6813
1.9263	1.9553	12.6496
2.1287	1.9863	8.7090
2.3302	2.0033	4.8199
2.5308	2.0067	.9704
3.1313	1.9968	-.9432
4.1321	1.9804	-.9432
5.1330	1.9639	-.9433
6.1338	1.9474	-.9432
7.1347	1.9309	-.9432
7.7352	1.9210	-.9432
8.1429	2.0288	14.8045
9.1622	2.2982	14.8045
10.1815	2.5676	14.8045
11.4047	2.8909	14.8045

APPENDIX

OUTPUT

X	P/PO	M	CP	Y	S/L
.0037	7.29368	0.0000	1.6996	-.115390	-.002542
NEWTONIAN					
.0006	7.26030	.0810	1.6906	.015028	.001342
NEWTONIAN					
.0034	7.20124	.1351	1.6747	.101949	.009110
NEWTONIAN					
.0105	7.11335	.1895	1.6509	.188630	.016878
NEWTONIAN					
.0218	6.99745	.2441	1.6196	.274865	.024646
NEWTONIAN					
.0372	6.85465	.2991	1.5811	.360451	.032414
NEWTONIAN					
.0568	6.68629	.3546	1.5356	.445185	.040182
NEWTONIAN					
.0805	6.49396	.4107	1.4837	.528869	.047950
NEWTONIAN					
.1082	6.27948	.4675	1.4257	.611304	.055718
NEWTONIAN					
.1398	6.04486	.5250	1.3624	.692295	.063486
NEWTONIAN					
.1754	5.79233	.5834	1.2942	.771652	.071254
NEWTONIAN					
.2148	5.52426	.6427	1.2218	.849187	.079022
NEWTONIAN					
.2579	5.24319	.7032	1.1459	.924716	.086790
NEWTONIAN					
.3047	4.95177	.7649	1.0672	.998062	.094558
NEWTONIAN					
.3549	4.65276	.8278	.9864	1.069052	.102326
NEWTONIAN					
.4085	4.34897	.8922	.9044	1.137517	.110094
NEWTONIAN					
.4654	4.04327	.9581	.8218	1.203296	.117862
NEWTONIAN					
.5254	3.73855	1.0257	.7395	1.266234	.125630
NEWTONIAN					
.5884	3.43768	1.0949	.6583	1.326182	.133399
NEWTONIAN					
.6542	3.14351	1.1659	.5789	1.382803	.141167
NEWTONIAN					
.7439	2.88663	1.2313	.5095	1.452356	.151318
NEWTONIAN					
.8500	2.63933	1.2981	.4427	1.528711	.162995
NEWTONIAN					
.9500	2.42430	1.3599	.3846	1.594293	.173675
1.1000	2.06667	1.4727	.2881	1.680623	.189133
1.3000	1.68203	1.6135	.1842	1.781191	.209135
1.5000	1.37368	1.7482	.1009	1.863940	.228473
1.7000	1.12121	1.8808	.0327	1.930412	.247302
1.9000	.91287	2.0134	-.0235	1.981735	.265748
2.1000	.73930	2.1485	-.0704	2.018703	.283918
2.3000	.59484	2.2875	-.1094	2.041838	.301905
2.7000	.54624	2.3420	-.1225	2.064423	.337680
3.5000	.58252	2.3009	-.1127	2.102885	.409191
4.5000	.62402	2.2569	-.1015	2.150961	.498580
5.5000	.66165	2.2195	-.0914	2.199038	.587969
6.5000	.69572	2.1874	-.0822	2.247115	.677357
7.3000	.72062	2.1649	-.0754	2.285577	.748868
7.8000	1.69569	1.5654	.1879	2.366920	.794515
8.5000	1.69514	1.5656	.1877	2.601140	.860421
9.5000	1.69514	1.5656	.1877	2.935740	.954572
10.6000	1.69514	1.5656	.1877	3.303800	1.058139

APPENDIX

INPUT DATA

M= 2.30 ALPHA= 4.00 THETA= -67.50

X	Y	DELTA
.0016	.0754	90.0000
.0064	.1506	86.3743
.0143	.2256	83.9571
.0254	.3002	81.5400
.0396	.3742	79.1228
.0570	.4476	76.7057
.0774	.5202	74.2885
.1008	.5918	71.8714
.1273	.6624	69.4542
.1567	.7318	67.0371
.1890	.8000	64.6199
.2242	.8667	62.2028
.2621	.9318	59.7856
.3028	.9953	57.3685
.3461	1.0570	54.9513
.3919	1.1169	52.5341
.4403	1.1747	50.1170
.4910	1.2305	47.6998
.5441	1.2841	45.2827
.5993	1.3354	42.8655
.7059	1.4267	40.5877
.8013	1.5014	38.0795
.8970	1.5704	35.7974
1.0895	1.6930	32.4902
1.2832	1.7969	28.2111
1.4779	1.8839	24.0727
1.6737	1.9553	20.0411
1.8704	2.0121	16.1004
2.0680	2.0549	12.2113
2.2665	2.0841	8.3619
2.8633	2.1515	6.4482
3.8580	2.2639	6.4482
4.8526	2.3763	6.4481
5.8473	2.4887	6.4483
6.8419	2.6012	6.4482
7.4387	2.6686	6.4482
7.8292	2.8279	22.1960
8.8054	3.2262	22.1960
9.7816	3.6245	22.1960
10.9530	4.1025	22.1960

APPENDIX

OUTPUT

X	P/PO	M	CP	Y	S/L
.0037	7.29368	0.0000	1.6996	.115199	.017025
NEWTONIAN					
.0150	7.26851	.0703	1.6928	.227709	.020391
NEWTONIAN					
.0261	7.22393	.1172	1.6808	.302254	.027123
NEWTONIAN					
.0405	7.15746	.1643	1.6628	.376262	.033856
NEWTONIAN					
.0579	7.06957	.2116	1.6391	.449600	.040588
NEWTONIAN					
.0784	6.96088	.2592	1.6097	.522137	.047320
NEWTONIAN					
.1019	6.83217	.3070	1.5750	.593746	.054052
NEWTONIAN					
.1285	6.68436	.3552	1.5351	.664298	.060785
NEWTONIAN					
.1580	6.51849	.4039	1.4903	.733668	.067517
NEWTONIAN					
.1904	6.33574	.4530	1.4409	.801732	.074249
NEWTONIAN					
.2256	6.13743	.5027	1.3874	.868369	.080981
NEWTONIAN					
.2636	5.92495	.5531	1.3300	.933462	.087714
NEWTONIAN					
.3043	5.69982	.6041	1.2692	.996893	.094446
NEWTONIAN					
.3477	5.46364	.6559	1.2054	1.058550	.101178
NEWTONIAN					
.3936	5.21809	.7085	1.1391	1.118324	.107911
NEWTONIAN					
.4420	4.96492	.7621	1.0707	1.176107	.114643
NEWTONIAN					
.4928	4.70593	.8166	1.0008	1.231798	.121375
NEWTONIAN					
.5459	4.44297	.8722	.9298	1.285297	.128107
NEWTONIAN					
.6012	4.17789	.9289	.8582	1.336508	.134840
NEWTONIAN					
.6586	3.91260	.9868	.7866	1.385873	.141572
NEWTONIAN					
.7439	3.66409	1.0425	.7194	1.452356	.151206
NEWTONIAN					
.8500	3.39403	1.1052	.6465	1.528711	.162883
NEWTONIAN					
.9500	3.15327	1.1635	.5815	1.594293	.173562
NEWTONIAN					
1.1000	2.81596	1.2500	.4904	1.680623	.189021
NEWTONIAN					
1.3000	2.40642	1.3652	.3798	1.781191	.209022
1.5000	1.96954	1.5060	.2618	1.863940	.228360
1.7000	1.62081	1.6384	.1676	1.930412	.247189
1.9000	1.33476	1.7671	.0904	1.981735	.265636
2.1000	1.09572	1.8957	.0258	2.018703	.283806
2.3000	.89504	2.0261	-.0283	2.041838	.301792
2.7000	.82327	2.0797	-.0477	2.064423	.337567
3.5000	.86196	2.0503	-.0373	2.102885	.409078
4.5000	.90351	2.0201	-.0261	2.150961	.498467
5.5000	.93856	1.9956	-.0166	2.199038	.587856
6.5000	.96823	1.9756	-.0086	2.247115	.677245
7.3000	.98884	1.9620	-.0030	2.285577	.748756
1ST ORDER SHOCK-EXP					
7.8000	2.25199	1.3736	.3381	2.366920	.794403
8.5000	2.26950	1.3681	.3428	2.601140	.860309
9.5000	2.29730	1.3593	.3503	2.935740	.954460
10.6000	2.31788	1.3529	.3559	3.303800	1.058026

APPENDIX

INPUT DATA

M= 2.30 ALPHA= 4.00 THETA= 45.00

X	Y	DELTA
.0020	.0856	90.0000
.0082	.1710	85.8852
.0184	.2560	83.1421
.0327	.3404	80.3989
.0510	.4241	77.6557
.0733	.5068	74.9126
.0995	.5883	72.1694
.1296	.6684	69.4262
.1635	.7471	66.6831
.2011	.8240	63.9399
.2424	.8990	61.1967
.2872	.9720	58.4536
.3354	1.0427	55.7104
.3870	1.1111	52.9672
.4417	1.1769	50.2241
.4996	1.2400	47.4809
.5604	1.3002	44.7377
.6241	1.3575	41.9946
.6904	1.4117	39.2514
.7592	1.4627	36.5082
.8754	1.5412	34.0633
.9786	1.6046	31.5551
1.0816	1.6623	29.2730
1.2866	1.7622	25.9658
1.4908	1.8434	21.6867
1.6941	1.9077	17.5483
1.8967	1.9564	13.5167
2.0985	1.9904	9.5760
2.2996	2.0104	5.6869
2.5001	2.0169	1.8374
3.1005	2.0161	-.0762
4.1011	2.0147	-.0762
5.1018	2.0134	-.0763
6.1024	2.0121	-.0762
7.1031	2.0108	-.0762
7.7035	2.0100	-.0762
8.1094	2.1238	15.6715
9.1242	2.4085	15.6715
10.1389	2.6932	15.6715
11.3567	3.0349	15.6715

APPENDIX

OUTPUT

X	P/PO	M	CP	Y	S/L
.0022	7.29368	0.0000	1.6996	-.088257	-.000238
NEWTONIAN					
.0010	7.26128	.0798	1.6909	.040139	.003585
NEWTONIAN					
.0049	7.20394	.1331	1.6754	.125646	.011231
NEWTONIAN					
.0130	7.11860	.1866	1.6523	.210864	.018877
NEWTONIAN					
.0251	7.00603	.2404	1.6219	.295600	.026522
NEWTONIAN					
.0413	6.86727	.2946	1.5845	.379658	.034168
NEWTONIAN					
.0615	6.70358	.3493	1.5403	.462846	.041813
NEWTONIAN					
.0856	6.51647	.4045	1.4897	.544973	.049459
NEWTONIAN					
.1136	6.30764	.4603	1.4333	.625851	.057105
NEWTONIAN					
.1455	6.07902	.5168	1.3716	.705294	.064750
NEWTONIAN					
.1811	5.83270	.5742	1.3051	.783122	.072396
NEWTONIAN					
.2205	5.57093	.6326	1.2344	.859154	.080042
NEWTONIAN					
.2634	5.29611	.6919	1.1602	.933218	.087687
NEWTONIAN					
.3098	5.01077	.7524	1.0831	1.005143	.095333
NEWTONIAN					
.3596	4.71751	.8142	1.0039	1.074764	.102979
NEWTONIAN					
.4127	4.41902	.8773	.9233	1.141922	.110624
NEWTONIAN					
.4689	4.11803	.9419	.8420	1.206463	.118270
NEWTONIAN					
.5281	3.81731	1.0080	.7608	1.268239	.125916
NEWTONIAN					
.5903	3.51961	1.0757	.6804	1.327109	.133561
NEWTONIAN					
.6549	3.22766	1.1452	.6016	1.383008	.141207
NEWTONIAN					
.7439	2.97446	1.2085	.5332	1.452356	.151297
NEWTONIAN					
.8500	2.72360	1.2748	.4655	1.528711	.162975
NEWTONIAN					
.9500	2.50477	1.3363	.4064	1.594293	.173654
1.1000	2.13518	1.4499	.3066	1.680623	.189112
1.3000	1.73928	1.5909	.1996	1.781191	.209114
1.5000	1.42225	1.7253	.1140	1.863940	.228452
1.7000	1.16254	1.8573	.0439	1.930412	.247281
1.9000	.94799	1.9892	-.0140	1.981735	.265728
2.1000	.76901	2.1233	-.0624	2.018703	.283898
2.3000	.61980	2.2612	-.1027	2.041838	.301884
2.7000	.56933	2.3155	-.1163	2.064423	.337659
3.5000	.60587	2.2757	-.1064	2.102885	.409170
4.5000	.64723	2.2335	-.0953	2.150961	.498559
5.5000	.68427	2.1980	-.0853	2.199038	.587948
6.5000	.71744	2.1677	-.0763	2.247115	.677337
7.3000	.74146	2.1467	-.0698	2.285577	.748848
1ST ORDER SHOCK-EXP					
7.8000	1.75899	1.5410	.2050	2.366920	.794495
8.5000	1.75995	1.5406	.2052	2.601140	.860401
9.5000	1.76147	1.5400	.2056	2.935740	.954552
10.6000	1.76261	1.5396	.2059	3.303800	1.058118

APPENDIX

INPUT DATA

M= 2.30 ALPHA= 4.00 THETA= -45.00

X	Y	DELTA
.0016	.0767	90.0000
.0066	.1533	86.3065
.0148	.2296	83.8443
.0263	.3055	81.3820
.0411	.3808	78.9197
.0590	.4554	76.4574
.0802	.5292	73.9951
.1045	.6020	71.5328
.1319	.6737	69.0705
.1624	.7441	66.6082
.1959	.8132	64.1459
.2323	.8808	61.6836
.2715	.9467	59.2213
.3136	1.0109	56.7590
.3584	1.0732	54.2967
.4058	1.1335	51.8344
.4558	1.1918	49.3721
.5082	1.2478	46.9098
.5630	1.3016	44.4475
.6201	1.3529	41.9852
.7280	1.4426	39.7207
.8245	1.5158	37.2125
.9212	1.5834	34.9304
1.1154	1.7030	31.6232
1.3106	1.8039	27.3441
1.5066	1.8879	23.2057
1.7033	1.9564	19.1741
1.9008	2.0101	15.2334
2.0990	2.0499	11.3443
2.2978	2.0761	7.4948
2.8954	2.1345	5.5812
3.8913	2.2318	5.5812
4.8872	2.3291	5.5811
5.8831	2.4264	5.5813
6.8790	2.5237	5.5812
7.4766	2.5821	5.5812
7.8693	2.7355	21.3289
8.8510	3.1188	21.3289
9.8328	3.5022	21.3289
11.0109	3.9622	21.3289

APPENDIX

OUTPUT

X	P/PO	M	CP	Y	S/L
.0022	7.29368	0.0000	1.6996	.088130	.014725
NEWTONIAN					
.0120	7.26756	.0716	1.6926	.202811	.018151
NEWTONIAN					
.0223	7.22131	.1194	1.6801	.278839	.025004
NEWTONIAN					
.0359	7.15236	.1674	1.6615	.354353	.031857
NEWTONIAN					
.0528	7.06122	.2156	1.6368	.429212	.038710
NEWTONIAN					
.0728	6.94856	.2641	1.6064	.503278	.045563
NEWTONIAN					
.0960	6.81522	.3128	1.5704	.576416	.052416
NEWTONIAN					
.1223	6.66218	.3620	1.5291	.648488	.059269
NEWTONIAN					
.1517	6.49057	.4117	1.4827	.719364	.066122
NEWTONIAN					
.1841	6.30165	.4618	1.4317	.788911	.072975
NEWTONIAN					
.2195	6.09683	.5126	1.3764	.857001	.079828
NEWTONIAN					
.2578	5.87761	.5640	1.3172	.923508	.086681
NEWTONIAN					
.2989	5.64561	.6161	1.2546	.988311	.093534
NEWTONIAN					
.3427	5.40254	.6691	1.1889	1.051288	.100387
NEWTONIAN					
.3892	5.15021	.7229	1.1208	1.112324	.107240
NEWTONIAN					
.4383	4.89046	.7778	1.0506	1.171306	.114093
NEWTONIAN					
.4898	4.62523	.8336	.9790	1.228125	.120946
NEWTONIAN					
.5438	4.35646	.8906	.9064	1.282676	.127799
NEWTONIAN					
.6001	4.08615	.9488	.8334	1.334859	.134652
NEWTONIAN					
.6582	3.81628	1.0082	.7605	1.385281	.141505
NEWTONIAN					
.7439	3.57021	1.0640	.6941	1.452356	.151199
NEWTONIAN					
.8500	3.30192	1.1272	.6216	1.528711	.162876
NEWTONIAN					
.9500	3.06338	1.1859	.5572	1.594293	.173556
NEWTONIAN					
1.1000	2.73028	1.2730	.4673	1.680623	.189014
NEWTONIAN					
1.3000	2.32788	1.3889	.3586	1.781191	.209016
1.5000	1.90471	1.5290	.2443	1.863940	.228354
1.7000	1.56589	1.6614	.1528	1.930412	.247183
1.9000	1.28787	1.7905	.0777	1.981735	.265629
2.1000	1.05566	1.9198	.0150	2.018703	.283800
2.3000	.86096	2.0510	-.0375	2.041838	.301786
2.7000	.79154	2.1049	-.0563	2.064423	.337561
3.5000	.82954	2.0748	-.0460	2.102885	.409072
4.5000	.87043	2.0440	-.0350	2.150961	.498461
5.5000	.90503	2.0190	-.0256	2.199038	.587850
6.5000	.93438	1.9985	-.0177	2.247115	.677238
7.3000	.95480	1.9846	-.0122	2.285577	.748750
1ST ORDER SHOCK-EXP					
7.8000	2.18323	1.3952	.3195	2.366920	.794396
8.5000	2.19794	1.3904	.3235	2.601140	.860302
9.5000	2.21989	1.3834	.3294	2.935740	.954454
10.6000	2.23547	1.3784	.3336	3.303800	1.058020

APPENDIX

INPUT DATA

M= 2.30 ALPHA= 4.00 THETA= 22.50

X	Y	DELTA
.0020	.0836	90.0000
.0078	.1669	85.9814
.0176	.2500	83.3023
.0312	.3324	80.6232
.0486	.4142	77.9441
.0699	.4950	75.2650
.0949	.5748	72.5859
.1236	.6533	69.9068
.1560	.7303	67.2277
.1919	.8058	64.5486
.2313	.8795	61.8696
.2741	.9513	59.1905
.3202	1.0210	56.5114
.3696	1.0885	53.8323
.4220	1.1536	51.1532
.4774	1.2162	48.4741
.5357	1.2761	45.7950
.5967	1.3332	43.1159
.6603	1.3874	40.4368
.7264	1.4386	37.7577
.8408	1.5198	35.3615
.9426	1.5855	32.8533
1.0441	1.6455	30.5711
1.2469	1.7500	27.2640
1.4491	1.8358	22.9848
1.6509	1.9047	18.8465
1.8523	1.9579	14.8148
2.0533	1.9965	10.8741
2.2539	2.0211	6.9851
2.4542	2.0321	3.1356
3.0544	2.0449	1.2219
4.0547	2.0662	1.2219
5.0551	2.0875	1.2219
6.0554	2.1089	1.2220
7.0558	2.1302	1.2219
7.6560	2.1430	1.2219
8.0592	2.2661	16.9697
9.0672	2.5737	16.9697
10.0752	2.8813	16.9697
11.2848	3.2504	16.9697

APPENDIX

OUTPUT

X	P/PO	M	CP	Y	S/L
.0006	7.29368	0.0000	1.6996	-.047756	.003199
NEWTONIAN					
.0022	7.26277	.0779	1.6913	.077581	.006931
NEWTONIAN					
.0078	7.20807	.1300	1.6765	.160957	.014395
NEWTONIAN					
.0172	7.12661	.1822	1.6545	.243980	.021858
NEWTONIAN					
.0306	7.01912	.2348	1.6255	.326470	.029322
NEWTONIAN					
.0477	6.88652	.2876	1.5897	.408247	.036785
NEWTONIAN					
.0687	6.72998	.3409	1.5474	.489131	.044249
NEWTONIAN					
.0935	6.55087	.3947	1.4990	.568946	.051713
NEWTONIAN					
.1219	6.35074	.4491	1.4450	.647517	.059176
NEWTONIAN					
.1540	6.13136	.5042	1.3857	.724673	.066640
NEWTONIAN					
.1897	5.89463	.5601	1.3218	.800244	.074103
NEWTONIAN					
.2288	5.64263	.6168	1.2537	.874066	.081567
NEWTONIAN					
.2714	5.37756	.6745	1.1822	.945978	.089030
NEWTONIAN					
.3172	5.10173	.7332	1.1077	1.015822	.096494
NEWTONIAN					
.3663	4.81756	.7931	1.0309	1.083445	.103958
NEWTONIAN					
.4185	4.52752	.8543	.9526	1.148699	.111421
NEWTONIAN					
.4737	4.23416	.9168	.8734	1.211443	.118885
NEWTONIAN					
.5318	3.94003	.9808	.7940	1.271538	.126348
NEWTONIAN					
.5926	3.64771	1.0463	.7150	1.328854	.133812
NEWTONIAN					
.6557	3.35976	1.1133	.6373	1.383508	.141276
NEWTONIAN					
.7439	3.10795	1.1747	.5693	1.452356	.151275
NEWTONIAN					
.8500	2.85220	1.2403	.5002	1.528711	.162952
NEWTONIAN					
.9500	2.62806	1.3012	.4397	1.594293	.173632
NEWTONIAN					
1.1000	2.32071	1.3911	.3567	1.680623	.189090
1.3000	1.88601	1.5358	.2393	1.781191	.209092
1.5000	1.54240	1.6715	.1465	1.863940	.228429
1.7000	1.26247	1.8036	.0709	1.930412	.247259
1.9000	1.03170	1.9347	.0086	1.981735	.265705
2.1000	.83917	2.0675	-.0434	2.018703	.283875
2.3000	.67848	2.2034	-.0868	2.041838	.301862
2.7000	.62319	2.2577	-.1018	2.064423	.337637
3.5000	.65990	2.2212	-.0918	2.102885	.409148
4.5000	.70080	2.1827	-.0808	2.150961	.498537
5.5000	.73677	2.1507	-.0711	2.199038	.587925
6.5000	.76841	2.1239	-.0625	2.247115	.677314
7.3000	.79102	2.1053	-.0564	2.285577	.748825
1ST ORDER SHOCK-EXP					
7.8000	1.85702	1.5051	.2314	2.366920	.794472
8.5000	1.85946	1.5042	.2321	2.601140	.860378
9.5000	1.86314	1.5028	.2331	2.935740	.954529
10.6000	1.86578	1.5018	.2338	3.303800	1.058096

APPENDIX

INPUT DATA

M= 2.30 ALPHA= 4.00 THETA= -22.50

X	Y	DELTA
.0017	.0788	90.0000
.0069	.1574	86.2093
.0156	.2357	83.6821
.0277	.3135	81.1550
.0433	.3908	78.6278
.0622	.4672	76.1007
.0845	.5428	73.5736
.1101	.6173	71.0464
.1389	.6906	68.5193
.1710	.7626	65.9921
.2062	.8331	63.4650
.2444	.9019	60.9378
.2857	.9690	58.4107
.3299	1.0343	55.8835
.3769	1.0975	53.3564
.4267	1.1586	50.8293
.4791	1.2174	48.3021
.5340	1.2738	45.7750
.5914	1.3278	43.2478
.6511	1.3792	40.7207
.7610	1.4664	38.4226
.8591	1.5374	35.9144
.9573	1.6028	33.6322
1.1542	1.7180	30.3251
1.3516	1.8144	26.0459
1.5494	1.8940	21.9076
1.7477	1.9579	17.8759
1.9463	2.0072	13.9352
2.1453	2.0425	10.0462
2.3447	2.0641	6.1967
2.9434	2.1089	4.2830
3.9412	2.1837	4.2830
4.9390	2.2584	4.2830
5.9367	2.3331	4.2831
6.9345	2.4078	4.2830
7.5332	2.4527	4.2831
7.9292	2.5971	20.0308
8.9194	2.9581	20.0308
9.9095	3.3190	20.0308
11.0977	3.7522	20.0308

APPENDIX

OUTPUT

X	P/PO	M	CP	Y	S/L
.0006	7.29368	0.0000	1.6996	.047718	.011296
NEWTONIAN					
.0081	7.26617	.0735	1.6922	.165628	.014813
NEWTONIAN					
.0172	7.21746	.1226	1.6790	.243871	.021848
NEWTONIAN					
.0296	7.14488	.1719	1.6594	.321641	.028882
NEWTONIAN					
.0455	7.04898	.2213	1.6335	.398784	.035917
NEWTONIAN					
.0648	6.93051	.2711	1.6015	.475152	.042952
NEWTONIAN					
.0874	6.79039	.3212	1.5637	.550596	.049987
NEWTONIAN					
.1134	6.62972	.3718	1.5203	.624968	.057021
NEWTONIAN					
.1425	6.44974	.4228	1.4717	.698125	.064056
NEWTONIAN					
.1749	6.25184	.4745	1.4183	.769924	.071091
NEWTONIAN					
.2104	6.03758	.5267	1.3604	.840226	.078125
NEWTONIAN					
.2490	5.80862	.5797	1.2986	.908893	.085160
NEWTONIAN					
.2906	5.56673	.6335	1.2333	.975792	.092195
NEWTONIAN					
.3351	5.31380	.6881	1.1649	1.040794	.099230
NEWTONIAN					
.3824	5.05179	.7438	1.0942	1.103770	.106264
NEWTONIAN					
.4324	4.78275	.8004	1.0215	1.164600	.113299
NEWTONIAN					
.4851	4.50876	.8582	.9475	1.223165	.120334
NEWTONIAN					
.5403	4.23196	.9173	.8728	1.279350	.127368
NEWTONIAN					
.5979	3.95449	.9776	.7979	1.333047	.134403
NEWTONIAN					
.6575	3.67852	1.0392	.7233	1.384738	.141438
NEWTONIAN					
.7439	3.43067	1.0965	.6564	1.452356	.151223
NEWTONIAN					
.8500	3.16547	1.1604	.5848	1.528711	.162900
NEWTONIAN					
.9500	2.93066	1.2198	.5214	1.594293	.173579
NEWTONIAN					
1.1000	2.60444	1.3078	.4333	1.680623	.189038
1.3000	2.11705	1.4559	.3017	1.781191	.209039
1.5000	1.73718	1.5917	.1991	1.863940	.228377
1.7000	1.42836	1.7225	.1157	1.930412	.247206
1.9000	1.17322	1.8514	.0468	1.981735	.265653
2.1000	.95954	1.9814	-.0109	2.018703	.283823
2.3000	.78028	2.1140	-.0593	2.041838	.301809
2.7000	.71766	2.1675	-.0762	2.064423	.337584
3.5000	.75599	2.1343	-.0659	2.102885	.409095
4.5000	.79775	2.0999	-.0546	2.150961	.498484
5.5000	.83354	2.0718	-.0450	2.199038	.587873
6.5000	.86429	2.0485	-.0366	2.247115	.677262
7.3000	.88589	2.0327	-.0308	2.285577	.748773
1ST ORDER SHOCK-EXP					
7.8000	2.04581	1.4399	.2824	2.366920	.794420
8.5000	2.06131	1.4346	.2866	2.601140	.860326
9.5000	2.08451	1.4267	.2929	2.935740	.954477
10.6000	2.10106	1.4211	.2973	3.303800	1.058043

APPENDIX

INPUT DATA

M= 2.30 ALPHA= 4.00 THETA= 0.00

X	Y	DELTA
.0018	.0812	90.0000
.0074	.1622	86.1004
.0166	.2429	83.5007
.0294	.3230	80.9010
.0459	.4026	78.3013
.0659	.4812	75.7016
.0895	.5589	73.1019
.1166	.6355	70.5022
.1472	.7107	67.9025
.1811	.7845	65.3028
.2183	.8566	62.7031
.2588	.9270	60.1034
.3024	.9955	57.5037
.3491	1.0620	54.9040
.3988	1.1262	52.3043
.4513	1.1881	49.7046
.5065	1.2476	47.1049
.5645	1.3045	44.5052
.6249	1.3588	41.9055
.6877	1.4102	39.3058
.8000	1.4945	36.8920
.9000	1.5629	34.3838
1.0000	1.6257	32.1017
1.2000	1.7356	28.7945
1.4000	1.8268	24.5154
1.6000	1.9011	20.3770
1.8000	1.9597	16.3454
2.0000	2.0037	12.4047
2.2000	2.0337	8.5156
2.4000	2.0500	4.6661
3.0000	2.0788	2.7525
4.0000	2.1269	2.7525
5.0000	2.1750	2.7524
6.0000	2.2231	2.7525
7.0000	2.2712	2.7525
7.6000	2.3000	2.7525
8.0000	2.4338	18.5002
9.0000	2.7684	18.5002
10.0000	3.1030	18.5002
11.2000	3.5046	18.5002

APPENDIX

OUTPUT

X	P/PO	M	CP	Y	S/L
.0000	7.29368	0.0000	1.6996	0.000000	.007251
NEWTONIAN					
.0046	7.26457	.0756	1.6918	.121684	.010876
NEWTONIAN					
.0120	7.21304	.1261	1.6778	.202528	.018126
NEWTONIAN					
.0230	7.13629	.1768	1.6571	.282956	.025377
NEWTONIAN					
.0376	7.03493	.2277	1.6297	.362801	.032628
NEWTONIAN					
.0559	6.90980	.2790	1.5959	.441899	.039878
NEWTONIAN					
.0777	6.76193	.3306	1.5560	.520088	.047129
NEWTONIAN					
.1031	6.59255	.3827	1.5103	.597206	.054379
NEWTONIAN					
.1319	6.40304	.4354	1.4591	.673095	.061630
NEWTONIAN					
.1641	6.19496	.4886	1.4029	.747599	.068880
NEWTONIAN					
.1997	5.97003	.5426	1.3422	.820563	.076131
NEWTONIAN					
.2386	5.73009	.5974	1.2774	.891839	.083381
NEWTONIAN					
.2806	5.47712	.6530	1.2091	.961278	.090632
NEWTONIAN					
.3258	5.21321	.7096	1.1378	1.028739	.097883
NEWTONIAN					
.3739	4.94052	.7672	1.0641	1.094083	.105133
NEWTONIAN					
.4250	4.66130	.8260	.9887	1.157174	.112384
NEWTONIAN					
.4789	4.37785	.8860	.9122	1.217884	.119634
NEWTONIAN					
.5355	4.09250	.9474	.8351	1.276087	.126885
NEWTONIAN					
.5947	3.80759	1.0102	.7582	1.331663	.134135
NEWTONIAN					
.6563	3.52547	1.0744	.6820	1.384498	.141386
NEWTONIAN					
.7439	3.26806	1.1354	.6125	1.452356	.151279
NEWTONIAN					
.8500	3.00721	1.2001	.5420	1.528711	.162956
NEWTONIAN					
.9500	2.77740	1.2603	.4800	1.594293	.173635
NEWTONIAN					
1.1000	2.46017	1.3493	.3943	1.680623	.189094
1.3000	2.00024	1.4954	.2701	1.781191	.209095
1.5000	1.63882	1.6310	.1725	1.863940	.228433
1.7000	1.34456	1.7623	.0930	1.930412	.247262
1.9000	1.10166	1.8922	.0275	1.981735	.265709
2.1000	.89861	2.0236	-.0274	2.018703	.283879
2.3000	.72869	2.1578	-.0733	2.041838	.301866
2.7000	.66975	2.2117	-.0892	2.064423	.337640
3.5000	.70716	2.1770	-.0791	2.102885	.409152
4.5000	.74824	2.1409	-.0680	2.150961	.498540
5.5000	.78378	2.1112	-.0584	2.199038	.587929
6.5000	.81457	2.0865	-.0501	2.247115	.677318
7.3000	.83631	2.0696	-.0442	2.285577	.748829
1ST ORDER SHOCK-EXP					
7.8000	1.94682	1.4735	.2557	2.366920	.794476
8.5000	1.95609	1.4702	.2582	2.601140	.860382
9.5000	1.97080	1.4650	.2622	2.935740	.954533
10.6000	1.98177	1.4611	.2651	3.303800	1.058099

APPENDIX

INPUT DATA

M= 2.30 ALPHA= 4.00 THETA= -0.00

X	Y	DELTA
.0018	.0812	90.0000
.0074	.1622	86.1004
.0166	.2429	83.5007
.0294	.3230	80.9010
.0459	.4026	78.3013
.0659	.4812	75.7016
.0895	.5589	73.1019
.1166	.6355	70.5022
.1472	.7107	67.9025
.1811	.7845	65.3028
.2183	.8566	62.7031
.2588	.9270	60.1034
.3024	.9955	57.5037
.3491	1.0620	54.9040
.3988	1.1262	52.3043
.4513	1.1881	49.7046
.5065	1.2476	47.1049
.5645	1.3045	44.5052
.6249	1.3588	41.9055
.6877	1.4102	39.3058
.8000	1.4945	36.8920
.9000	1.5629	34.3838
1.0000	1.6257	32.1017
1.2000	1.7356	28.7945
1.4000	1.8268	24.5154
1.6000	1.9011	20.3770
1.8000	1.9597	16.3454
2.0000	2.0037	12.4047
2.2000	2.0337	8.5156
2.4000	2.0500	4.6661
3.0000	2.0788	2.7525
4.0000	2.1269	2.7525
5.0000	2.1750	2.7524
6.0000	2.2231	2.7525
7.0000	2.2712	2.7525
7.6000	2.3000	2.7525
8.0000	2.4338	18.5002
9.0000	2.7684	18.5002
10.0000	3.1030	18.5002
11.2000	3.5046	18.5002

APPENDIX

OUTPUT

X	P/PO	M	CP	Y	S/L
.0000	7.29368	0.0000	1.6996	0.000000	.007251
NEWTONIAN					
.0046	7.26457	.0756	1.6918	.121684	.010876
NEWTONIAN					
.0120	7.21304	.1261	1.6778	.202528	.018126
NEWTONIAN					
.0230	7.13629	.1768	1.6571	.282956	.025377
NEWTONIAN					
.0376	7.03493	.2277	1.6297	.362801	.032628
NEWTONIAN					
.0559	6.90980	.2790	1.5959	.441899	.039878
NEWTONIAN					
.0777	6.76193	.3306	1.5560	.520088	.047129
NEWTONIAN					
.1031	6.59255	.3827	1.5103	.597206	.054379
NEWTONIAN					
.1319	6.40304	.4354	1.4591	.673095	.061630
NEWTONIAN					
.1641	6.19496	.4886	1.4029	.747599	.068880
NEWTONIAN					
.1997	5.97003	.5426	1.3422	.820563	.076131
NEWTONIAN					
.2386	5.73009	.5974	1.2774	.891839	.083381
NEWTONIAN					
.2806	5.47712	.6530	1.2091	.961278	.090632
NEWTONIAN					
.3258	5.21321	.7096	1.1378	1.028739	.097883
NEWTONIAN					
.3739	4.94052	.7672	1.0641	1.094083	.105133
NEWTONIAN					
.4250	4.66130	.8260	.9887	1.157174	.112384
NEWTONIAN					
.4789	4.37785	.8860	.9122	1.217884	.119634
NEWTONIAN					
.5355	4.09250	.9474	.8351	1.276087	.126885
NEWTONIAN					
.5947	3.80759	1.0102	.7582	1.331663	.134135
NEWTONIAN					
.6563	3.52547	1.0744	.6820	1.384498	.141386
NEWTONIAN					
.7439	3.26806	1.1354	.6125	1.452356	.151279
NEWTONIAN					
.8500	3.00721	1.2001	.5420	1.528711	.162956
NEWTONIAN					
.9500	2.77740	1.2603	.4800	1.594293	.173635
NEWTONIAN					
1.1000	2.46017	1.3493	.3943	1.680623	.189094
1.3000	2.00024	1.4954	.2701	1.781191	.209095
1.5000	1.63882	1.6310	.1725	1.863940	.228433
1.7000	1.34456	1.7623	.0930	1.930412	.247262
1.9000	1.10166	1.8922	.0275	1.981735	.265709
2.1000	.89861	2.0236	-.0274	2.018703	.283879
2.3000	.72869	2.1578	-.0733	2.041838	.301866
2.7000	.66975	2.2117	-.0892	2.064423	.337640
3.5000	.70716	2.1770	-.0791	2.102885	.409152
4.5000	.74824	2.1409	-.0680	2.150961	.498540
5.5000	.78378	2.1112	-.0584	2.199038	.587929
6.5000	.81457	2.0865	-.0501	2.247115	.677318
7.3000	.83631	2.0696	-.0442	2.285577	.748829
1ST ORDER SHOCK-EXP					
7.8000	1.94682	1.4735	.2557	2.366920	.794476
8.5000	1.95609	1.4702	.2582	2.601140	.860382
9.5000	1.97080	1.4650	.2622	2.935740	.954533
10.6000	1.98177	1.4611	.2651	3.303800	1.058099

CA= .38379 CN= .13583 CM= -.08185

2ND EXAMPLE CASE *** MODEL 2 - FORCE DATA

M= 2.30 ALPHA= 8.00 CA= .38976 CN= .27864 CM= -.16904

REFERENCES

1. McLaughlin, E. J.: Prediction of Hypersonic Pressure Distribution and Resulting Force Coefficients on Blunted Conical Bodies of Elliptical Cross Sections. OR 6660, Martin-Marietta Corp., July 1965.
2. Syvertson, Clarence A.; and Dennis, David H.: A Second-Order Shock-Expansion Method Applicable to Bodies of Revolution Near Zero Lift. NACA Rep. 1328, 1957. (Supersedes NACA TN 3527.)
3. Mechtly, E. A.: The International System of Units – Physical Constants and Conversion Factors. NASA SP-7012, 1964.
4. Seiff, Alvin: Secondary Flow Fields Embedded in Hypersonic Shock Layers. NASA TN D-1304, 1962.
5. Kuehn, Donald M.: Laminar Boundary-Layer Separation Induced by Flares on Cylinders at Zero Angle of Attack. NASA TR-146, 1962.
6. Gentry, Arvel E.: Hypersonic Arbitrary-Body Aerodynamic Computer Program. Rep. DAC 56080 (Air Force Contract No. F33615 67 C 1008), Douglas Aircraft Co., Mar. 1967.
   Vol. I – User's Manual. (Available from DDC as AD817158.)
   Vol. II – Program Formulation and Listings. (Available from DDC as AD817159.)
7. Sims, Joseph L.: Tables for Supersonic Flow Around Right Circular Cones at Zero Angle of Attack. NASA SP-3004, 1964.

TABLE I.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT $M_{\infty} = 1.50$

(a) $\alpha = 0°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.5372	1.5588	1.5279	1.5402	1.5259	1.5372	1.5588	1.5279	1.5402	1.5259	.0000
.0206	1.4727	1.4565	1.4558	1.4719	1.4575	1.4727	1.4944	1.4710	1.4757	1.4727	.0206
.0412	1.2486	1.2406	1.2433	1.2517	1.2448	1.2904	1.2822	1.2851	1.3086	1.2828	.0412
.0619	.9334	.9299	.9322	.9404	.9335	1.0132	.9981	.9929	1.0050	.9904	.0619
.0825	.5765	.5699	.5717	.5722	.5727	.5841	.5775	.5831	.5836	.5803	.0825
.1031	.2309	.2214	.2188	.2306	.2233	.2499	.2555	.2530	.2533	.2499	.1031
.1237	-.0881	-.0931	-.0923	-.0845	-.0919	-.0463	-.0477	-.0430	-.0465	-.0501	.1237
.1443	-.1109	-.1045	-.1113	-.1111	-.1109	-.1071	-.1045	-.1037	-.0997	-.1033	.1443
.1649	-.0501	-.0477	-.0544	-.0503	-.0539	-.0425	-.0401	-.0354	-.0351	-.0349	.1649
.1856	-.0083	-.0060	-.0088	-.0048	-.0045	-.0007	.0016	.0063	.0104	.0031	.1856
.2062	.0410	.0319	.0329	.0408	.0372	.0600	.0584	.0633	.0673	.0600	.2062
.2474	.0816	.0814	.0781	.0841	.0802	.0830	.0841	.0870	.0974	.0896	.2474
.2887	.1050	.1086	.1028	.1101	.1049	.1052	.1115	.1092	.1130	.1091	.2887
.3299	.1283	.1319	.1288	.1360	.1296	.1274	.1336	.1274	.1312	.1261	.3299
.3711	.1426	.1436	.1417	.1490	.1413	.1404	.1336	.1365	.1494	.1378	.3711
.4124	.1491	.1449	.1430	.1503	.1413	.1639	.1466	.1496	.1611	.1482	.4124
.4536	.1491	.1449	.1430	.1464	.1426	.1548	.1453	.1496	.1520	.1495	.4536
.4948	.1478	.1449	.1443	.1490	.1452	.1548	.1518	.1535	.1585	.1521	.4948
.5361	.1478	.1449	.1456	.1516	.1465	.1574	.1531	.1561	.1598	.1534	.5361
.5773	.1647	.1578	.1586	.1620	.1569	.1692	.1597	.1600	.1664	.1560	.5773
.6186	.1543	.1604	.1508	.1555	.1491	.1652	.1766	.1587	.1664	.1586	.6186
.6598	.1478	.1539	.1482	.1516	.1517	.1587	.1701	.1613	.1611	.1560	.6598
.7010	.1530	.1501	.1534	.1607	.1504	.1639	.1597	.1639	.1729	.1599	.7010
.7423	.1686	.1643	.1599	.1607	.1582	.1796	.1701	.1691	.1716	.1599	.7423
.7835	.1582	.1565	.1521	.1555	.1556	.1744	.1675	.1665	.1690	.1625	.7835
.8247	.1556	.1578	.1508	.1555	.1530	.1731	.1753	.1665	.1690	.1612	.8247
.8660	.1608	.1552	.1547	.1555	.1569	.1692	.1636	.1652	.1677	.1599	.8660
.9072	.1543	.1488	.1495	.1516	.1491	.1652	.1636	.1652	.1690	.1612	.9072
.9485	.1569	.1527	.1534	.1516	.1543	.1626	.1649	.1691	.1690	.1625	.9485
.9897	.1543	.1527	.1534	.1529	.1517	.1561	.1584	.1626	.1677	.1560	.9897
1.0309	.1491	.1501	.1482	.1490	.1452	.1600	.1584	.1626	.1690	.1560	1.0309

(b) $\alpha = 4°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.5144	1.5284	1.5161	1.5201	1.5187	1.5144	1.5284	1.5161	1.5201	1.5187	.0000
.0206	1.4005	1.4145	1.4174	1.4328	1.4465	1.5030	1.5056	1.4933	1.4821	1.4655	.0206
.0412	1.1537	1.1678	1.1784	1.2052	1.2376	1.3625	1.3614	1.3378	1.3114	1.2756	.0412
.0619	.8195	.8300	.8560	.8865	.9299	1.0967	1.1185	1.0684	1.0344	.9907	.0619
.0825	.4587	.4657	.4880	.5223	.5653	.6980	.7086	.6663	.6247	.5767	.0825
.1031	.1094	.1241	.1428	.1732	.2159	.3638	.3594	.3325	.2946	.2463	.1031
.1237	-.1678	-.1605	-.1455	-.1227	-.0880	.0410	.0406	.0176	-.0127	-.0462	.1237
.1443	-.1868	-.1795	-.1645	-.1379	-.1070	-.0159	-.0201	-.0355	-.0658	-.0994	.1443
.1649	-.1375	-.1302	-.1190	-.0886	-.0538	.0638	.0596	.0328	-.0013	-.0348	.1649
.1856	-.0957	-.0922	-.0735	-.0431	-.0120	.1056	.1052	.0783	.0404	.0032	.1856
.2062	-.0539	-.0429	-.0355	-.0127	.0222	.1549	.1545	.1314	.0935	.0564	.2062
.2474	-.0001	.0080	.0195	.0435	.0730	.1766	.1711	.1533	.1148	.0824	.2474
.2887	.0311	.0404	.0546	.0734	.1002	.1870	.1828	.1676	.1317	.1019	.2887
.3299	.0622	.0689	.0806	.0941	.1145	.2013	.1933	.1833	.1447	.1162	.3299
.3711	.0869	.0870	.0922	.1058	.1236	.2079	.1985	.1885	.1512	.1201	.3711
.4124	.0973	.1013	.1000	.1097	.1275	.2170	.2103	.1911	.1656	.1357	.4124
.4536	.0999	.1013	.1013	.1110	.1327	.2118	.2064	.1924	.1656	.1409	.4536
.4948	.1038	.1039	.1065	.1149	.1353	.2131	.2090	.1963	.1669	.1409	.4948
.5361	.1051	.1078	.1091	.1175	.1340	.2144	.2116	.1963	.1708	.1435	.5361
.5773	.1129	.1181	.1195	.1292	.1457	.2157	.2129	.1963	.1708	.1474	.5773
.6186	.1064	.1117	.1130	.1240	.1392	.2157	.2155	.1963	.1708	.1474	.6186
.6598	.1051	.1065	.1104	.1227	.1392	.2170	.2103	.1976	.1708	.1461	.6598
.7010	.1090	.1117	.1117	.1201	.1353	.2170	.2168	.1989	.1747	.1474	.7010
.7423	.1168	.1285	.1195	.1317	.1496	.2235	.2338	.1989	.1747	.1487	.7423
.7835	.1129	.1194	.1143	.1253	.1431	.2313	.2364	.1989	.1747	.1500	.7835
.8247	.1103	.1117	.1117	.1214	.1418	.2287	.2220	.1989	.1747	.1500	.8247
.8660	.1116	.1169	.1156	.1253	.1457	.2261	.2220	.1989	.1747	.1487	.8660
.9072	.1090	.1078	.1117	.1214	.1379	.2196	.2168	.1989	.1760	.1500	.9072
.9485	.1103	.1117	.1156	.1253	.1405	.2196	.2181	.1989	.1760	.1526	.9485
.9897	.1103	.1156	.1156	.1240	.1366	.2131	.2129	.1989	.1734	.1461	.9897
1.0309	.1103	.1091	.1104	.1201	.1327	.2144	.2064	.2028	.1747	.1448	1.0309

TABLE I.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT M_∞ = 1.50 - Concluded

(c) α = 8°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.4906	1.4938	1.4979	1.4928	1.4969	1.4906	1.4938	1.4979	1.4928	1.4969	.0000
.0206	1.3312	1.3504	1.3612	1.3942	1.4247	1.5210	1.5051	1.5016	1.4739	1.4399	.0206
.0412	1.0579	1.0597	1.1032	1.1553	1.2195	1.4223	1.4221	1.3802	1.3259	1.2575	.0412
.0619	.7087	.7238	.7692	.8329	.9155	1.1946	1.1730	1.1335	1.0604	.9763	.0619
.0825	.3368	.3464	.4011	.4726	.5545	.8188	.7993	.7464	.6660	.5697	.0825
.1031	.0217	.0256	.0671	.1312	.2125	.4810	.4634	.4087	.3322	.2429	.1031
.1237	-.2326	-.2273	-.1947	-.1457	-.0915	.1356	.1237	.0861	.0212	-.0459	.1237
.1443	-.2516	-.2462	-.2137	-.1646	-.1067	.0862	.0709	.0292	-.0319	-.0991	.1443
.1649	-.2060	-.1971	-.1681	-.1153	-.0497	.1811	.1577	.1089	.0402	-.0345	.1649
.1856	-.1681	-.1594	-.1302	-.0736	-.0041	.2229	.2030	.1506	.0819	.0035	.1856
.2062	-.1301	-.1254	-.0960	-.0432	.0225	.2722	.2520	.2000	.1312	.0567	.2062
.2474	-.0724	-.0781	-.0420	.0025	.0655	.2845	.2648	.2168	.1455	.0734	.2474
.2887	-.0296	-.0265	-.0095	.0245	.0785	.2819	.2699	.2233	.1520	.0812	.2887
.3299	.0132	.0136	.0151	.0427	.0837	.2884	.2687	.2272	.1572	.0890	.3299
.3711	.0404	.0420	.0424	.0647	.1019	.2910	.2712	.2272	.1598	.1008	.3711
.4124	.0585	.0575	.0515	.0582	.1019	.2923	.2738	.2259	.1716	.1126	.4124
.4536	.0676	.0601	.0528	.0582	.0967	.2858	.2674	.2259	.1676	.1034	.4536
.4948	.0715	.0653	.0579	.0608	.0967	.2884	.2725	.2272	.1676	.1034	.4948
.5361	.0715	.0653	.0605	.0673	.0980	.2910	.2699	.2325	.1676	.1034	.5361
.5773	.0806	.0846	.0748	.0803	.1084	.2923	.2854	.2325	.1676	.1034	.5773
.6186	.0741	.0743	.0644	.0686	.0967	.2923	.2790	.2338	.1716	.1086	.6186
.6598	.0715	.0653	.0631	.0686	.0980	.2949	.2725	.2325	.1663	.1047	.6598
.7010	.0754	.0743	.0644	.0738	.1032	.2949	.2867	.2311	.1663	.1086	.7010
.7423	.0819	.0769	.0748	.0829	.1136	.2949	.2764	.2325	.1689	.1126	.7423
.7835	.0754	.0743	.0709	.0764	.1058	.2923	.2803	.2311	.1702	.1139	.7835
.8247	.0754	.0730	.0709	.0764	.1045	.2858	.2764	.2298	.1702	.1139	.8247
.8660	.0780	.0743	.0748	.0829	.1110	.2858	.2712	.2285	.1689	.1139	.8660
.9072	.0754	.0743	.0709	.0764	.1045	.2858	.2712	.2272	.1702	.1152	.9072
.9485	.0806	.0769	.0735	.0816	.1058	.2832	.2712	.2246	.1702	.1139	.9485
.9897	.0793	.0743	.0748	.0841	.1071	.2819	.2648	.2233	.1650	.1139	.9897
1.0309	.0754	.0730	.0735	.0854	.1097	.2819	.2687	.2207	.1729	.1217	1.0309

(d) α = 12°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.4527	1.4568	1.4653	1.4572	1.4627	1.4527	1.4568	1.4653	1.4572	1.4627	.0000
.0206	1.2591	1.2746	1.3023	1.3395	1.3943	1.5286	1.5214	1.4956	1.4534	1.4057	.0206
.0412	.9517	.9709	1.0255	1.0965	1.1929	1.4755	1.4644	1.4047	1.3243	1.2309	.0412
.0619	.5987	.6330	.6768	.7776	.8965	1.2819	1.2746	1.1886	1.0737	.9535	.0619
.0825	.2115	.2382	.3128	.4206	.5507	.9327	.9064	.8170	.6940	.5545	.0825
.1031	-.0732	-.0541	.0020	.0903	.2125	.5987	.5799	.4872	.3675	.2353	.1031
.1237	-.2933	-.2819	-.2407	-.1755	-.0915	.2381	.2117	.1460	.0523	-.0497	.1237
.1443	-.3047	-.2971	-.2596	-.1945	-.1067	.2039	.1775	.1081	.0068	-.0991	.1443
.1649	-.2554	-.2553	-.2217	-.1489	-.0497	.3216	.2800	.1991	.0865	-.0345	.1649
.1856	-.2326	-.2249	-.1838	-.1109	-.0117	.3633	.3331	.2446	.1283	.0073	.1856
.2062	-.2060	-.1870	-.1497	-.0806	.0187	.4013	.3711	.2863	.1738	.0605	.2062
.2474	-.1374	-.1430	-.1062	-.0395	.0512	.3896	.3632	.2819	.1820	.0744	.2474
.2887	-.0841	-.0911	-.0789	-.0278	.0538	.3805	.3528	.2754	.1702	.0679	.2887
.3299	-.0308	-.0171	-.0439	-.0148	.0590	.3805	.3567	.2741	.1729	.0705	.3299
.3711	.0224	.0063	-.0296	-.0096	.0616	.3805	.3528	.2754	.1755	.0692	.3711
.4124	.0445	.0180	-.0140	-.0135	.0590	.3792	.3476	.2832	.1755	.0679	.4124
.4536	.0445	.0322	-.0140	-.0200	.0473	.3766	.3437	.2780	.1676	.0548	.4536
.4948	.0458	.0387	-.0101	-.0213	.0408	.3805	.3593	.2754	.1663	.0535	.4948
.5361	.0458	.0348	.0003	-.0200	.0395	.3818	.3528	.2806	.1585	.0535	.5361
.5773	.0510	.0478	.0172	-.0070	.0473	.3792	.3593	.2741	.1559	.0522	.5773
.6186	.0445	.0387	.0146	-.0096	.0369	.3740	.3554	.2754	.1559	.0509	.6186
.6598	.0432	.0348	.0120	-.0083	.0317	.3688	.3463	.2637	.1533	.0483	.6598
.7010	.0484	.0426	.0172	-.0005	.0343	.3714	.3463	.2663	.1533	.0496	.7010
.7423	.0549	.0530	.0276	.0138	.0460	.3714	.3541	.2676	.1533	.0509	.7423
.7835	.0536	.0465	.0237	.0112	.0421	.3701	.3437	.2650	.1533	.0522	.7835
.8247	.0523	.0517	.0250	.0138	.0421	.3688	.3554	.2637	.1507	.0509	.8247
.8660	.0549	.0491	.0302	.0242	.0499	.3675	.3437	.2585	.1468	.0561	.8660
.9072	.0510	.0452	.0302	.0216	.0538	.3688	.3411	.2559	.1494	.0666	.9072
.9485	.0523	.0491	.0276	.0177	.0525	.3675	.3424	.2637	.1598	.0666	.9485
.9897	.0536	.0465	.0224	.0151	.0486	.3623	.3411	.2624	.1520	.0587	.9897
1.0309	.0536	.0413	.0185	.0125	.0473	.3649	.3424	.2663	.1468	.0587	1.0309

TABLE II.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT $M_\infty = 1.90$

(a) $\alpha = 0°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6264	1.6266	1.6273	1.6262	1.6264	1.6264	1.6266	1.6273	1.6262	1.6264	.0000
.0206	1.5467	1.5469	1.5514	1.5503	1.5505	1.5695	1.5697	1.5704	1.5693	1.5657	.0206
.0412	1.3305	1.3306	1.3275	1.3303	1.3343	1.3722	1.3762	1.3730	1.3721	1.3722	.0412
.0619	1.0042	1.0043	1.0049	1.0041	1.0080	1.0763	1.0764	1.0770	1.0762	1.0687	.0619
.0825	.6400	.6401	.6405	.6437	.6438	.6590	.6629	.6595	.6589	.6514	.0825
.1031	.3023	.2986	.2989	.3023	.3061	.3365	.3404	.3368	.3364	.3289	.1031
.1237	.0292	.0254	.0256	.0291	.0330	.0671	.0672	.0673	.0671	.0633	.1237
.1443	-.0050	-.0049	-.0048	-.0050	-.0050	.0064	.0065	.0066	.0064	.0026	.1443
.1649	.0178	.0178	.0180	.0178	.0216	.0406	.0406	.0408	.0405	.0406	.1649
.1856	.0406	.0406	.0408	.0405	.0406	.0595	.0558	.0597	.0557	.0557	.1856
.2062	.0520	.0520	.0522	.0519	.0519						.2062
.2474	.0779	.0766	.0761	.0778	.0805	.0904	.0938	.0924	.0909	.0873	.2474
.2887	.0895	.0882	.0878	.0908	.0909	.0995	.1003	.1002	.1000	.0990	.2887
.3299	.1012	.0999	.0995	.1011	.1012	.1074	.1068	.1067	.1065	.1055	.3299
.3711	.1103	.1090	.1086	.1076	.1090	.1139	.1133	.1146	.1144	.1120	.3711
.4124	.1116	.1090	.1086	.1089	.1103	.1217	.1224	.1224	.1222	.1211	.4124
.4536	.1142	.1116	.1099	.1115	.1129	.1217	.1211	.1172	.1157	.1185	.4536
.4948	.1168	.1129	.1124	.1128	.1142	.1217	.1224	.1211	.1183	.1198	.4948
.5361	.1168	.1142	.1124	.1141	.1155	.1230	.1237	.1237	.1222	.1263	.5361
.5773	.1246	.1220	.1228	.1232	.1246	.1230	.1237	.1237	.1248	.1263	.5773
.6186	.1194	.1181	.1176	.1167	.1181	.1230	.1263	.1289	.1287	.1263	.6186
.6598	.1181	.1168	.1163	.1154	.1181	.1256	.1289	.1289	.1287	.1276	.6598
.7010	.1194	.1168	.1176	.1193	.1194	.1269	.1289	.1289	.1287	.1276	.7010
.7423	.1272	.1246	.1280	.1297	.1285	.1295	.1302	.1289	.1300	.1276	.7423
.7835	.1246	.1233	.1254	.1245	.1246	.1295	.1315	.1276	.1274	.1289	.7835
.8247	.1116	.1233	.1215	.1219	.1233	.1282	.1302	.1276	.1248	.1302	.8247
.8660	.1285	.1272	.1241	.1245	.1233	.1282	.1289	.1276	.1248	.1302	.8660
.9072	.1272	.1233	.1202	.1167	.1194	.1295	.1289	.1276	.1235	.1315	.9072
.9485	.1324	.1272	.1202	.1232	.1233	.1321	.1315	.1289	.1300	.1329	.9485
.9897	.1311	.1259	.1176	.1232	.1233	.1282	.1263	.1237	.1300	.1302	.9897
1.0309	.1285	.1246	.1202	.1232	.1259	.1295	.1289	.1341	.1352	.1315	1.0309

(b) $\alpha = 4°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6117	1.6126	1.6119	1.6148	1.6184	1.6117	1.6126	1.6119	1.6148	1.6184	.0000
.0206	1.4903	1.4950	1.5056	1.5238	1.5426	1.6079	1.6013	1.5967	1.5807	1.5615	.0206
.0412	1.2284	1.2368	1.2590	1.2886	1.3264	1.4561	1.4494	1.4297	1.4024	1.3681	.0412
.0619	.8907	.9027	.9250	.9624	1.0077	1.1867	1.1798	1.1527	1.1141	1.0722	.0619
.0825	.5188	.5268	.5531	.5944	.6436	.7844	.7698	.7466	.7006	.6512	.0825
.1031	.2038	.2079	.2267	.2606	.2984	.4505	.4395	.4126	.3744	.3288	.1031
.1237	-.0390	-.0351	-.0238	.0026	.0329	.1507	.1472	.1280	.0974	.0670	.1237
.1443	-.0732	-.0692	-.0542	-.0315	-.0050	.0824	.0788	.0635	.0367	.0063	.1443
.1649	-.0504	-.0464	-.0314	-.0088	.0215	.1242	.1168	.0976	.0709	.0405	.1649
.1856	-.0314	-.0275	-.0124	.0102	.0405	.1431	.1358	.1166	.0898	.0557	.1856
.2062	-.0163	-.0161	.0028	.0254	.0519						.2062
.2474	.0079	.0093	.0260	.0472	.0752	.1765	.1695	.1485	.1197	.0877	.2474
.2887	.0260	.0301	.0403	.0601	.0869	.1804	.1708	.1498	.1236	.0956	.2887
.3299	.0416	.0430	.0494	.0653	.0921	.1831	.1747	.1563	.1288	.0995	.3299
.3711	.0533	.0560	.0571	.0718	.0973	.1857	.1760	.1563	.1302	.1060	.3711
.4124	.0572	.0599	.0636	.0757	.0986	.1922	.1839	.1615	.1354	.1060	.4124
.4536	.0624	.0638	.0662	.0783	.0999	.1883	.1786	.1576	.1328	.1060	.4536
.4948	.0650	.0651	.0701	.0809	.1011	.1883	.1786	.1602	.1328	.1060	.4948
.5361	.0663	.0677	.0727	.0822	.1024	.1896	.1800	.1628	.1367	.1099	.5361
.5773	.0754	.0768	.0818	.0874	.1050	.1883	.1800	.1641	.1393	.1125	.5773
.6186	.0715	.0729	.0792	.0887	.1050	.1883	.1813	.1693	.1406	.1151	.6186
.6598	.0702	.0716	.0805	.0913	.1089	.1896	.1826	.1706	.1406	.1177	.6598
.7010	.0715	.0742	.0831	.0939	.1102	.1896	.1839	.1693	.1419	.1216	.7010
.7423	.0792	.0833	.0883	.0978	.1180	.1948	.1839	.1693	.1445	.1216	.7423
.7835	.0792	.0833	.0844	.0952	.1141	.1935	.1852	.1667	.1445	.1190	.7835
.8247	.0805	.0807	.0831	.0913	.1102	.1922	.1839	.1667	.1419	.1151	.8247
.8660	.0857	.0833	.0857	.0926	.1115	.1896	.1826	.1667	.1419	.1151	.8660
.9072	.0844	.0820	.0792	.0900	.1089	.1922	.1839	.1667	.1393	.1190	.9072
.9485	.0870	.0859	.0831	.0952	.1141	.1948	.1865	.1680	.1497	.1242	.9485
.9897	.0844	.0820	.0844	.0952	.1141	.1883	.1786	.1641	.1458	.1216	.9897
1.0309	.0818	.0820	.0857	.0952	.1154	.1896	.1813	.1732	.1510	.1242	1.0309

TABLE II.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT $M_\infty = 1.90$ - Concluded

(c) $\alpha = 8°$

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.5878	1.5888	1.5892	1.5880	1.5952	1.5878	1.5888	1.5892	1.5880	1.5952	.0000
.0206	1.4171	1.4294	1.4450	1.4780	1.5194	1.6257	1.6191	1.6006	1.5691	1.5345	.0206
.0412	1.1251	1.1410	1.1755	1.2353	1.3070	1.5233	1.5129	1.4753	1.4174	1.3487	.0412
.0619	.7800	.7957	.8339	.9091	.9922	1.2844	1.2700	1.2210	1.1443	1.0567	.0619
.0825	.4007	.4163	.4620	.5374	.6320	.9013	.8868	.8263	.7384	.6433	.0825
.1031	.1125	.1279	.1622	.2225	.2983	.5638	.5491	.4924	.4160	.3286	.1031
.1237	-.0999	-.0884	-.0655	-.0240	.0290	.2414	.2266	.1849	.1315	.0631	.1237
.1443	-.1265	-.1187	-.0959	-.0544	-.0051	.1694	.1583	.1166	.0670	.0063	.1443
.1649	-.1113	-.0998	-.0769	-.0354	.0214	.2225	.2076	.1622	.1050	.0404	.1649
.1856	-.0885	-.0808	-.0580	-.0164	.0404	.2414	.2228	.1811	.1201	.0593	.1856
.2062	-.0734	-.0694	-.0428	-.0012	.0518						.2062
.2474	-.0433	-.0402	-.0207	.0168	.0707	.2653	.2486	.2052	.1483	.0837	.2474
.2887	-.0226	-.0208	-.0064	.0271	.0772	.2614	.2473	.2052	.1470	.0889	.2887
.3299	-.0019	-.0065	.0040	.0310	.0784	.2653	.2486	.2039	.1483	.0889	.3299
.3711	.0111	.0039	.0118	.0362	.0810	.2705	.2499	.2026	.1457	.0889	.3711
.4124	.0188	.0117	.0144	.0349	.0797	.2705	.2525	.2052	.1483	.0889	.4124
.4536	.0253	.0194	.0208	.0375	.0784	.2627	.2460	.2013	.1444	.0902	.4536
.4948	.0292	.0298	.0299	.0414	.0797	.2614	.2460	.2026	.1457	.0915	.4948
.5361	.0331	.0337	.0299	.0427	.0810	.2627	.2473	.2052	.1496	.0928	.5361
.5773	.0447	.0415	.0364	.0505	.0888	.2627	.2486	.2052	.1496	.0928	.5773
.6186	.0435	.0389	.0351	.0479	.0823	.2653	.2525	.2052	.1561	.0915	.6186
.6598	.0435	.0402	.0338	.0440	.0823	.2653	.2525	.2039	.1535	.0915	.6598
.7010	.0447	.0415	.0351	.0440	.0797	.2666	.2512	.2039	.1483	.0889	.7010
.7423	.0525	.0467	.0416	.0505	.0836	.2666	.2525	.2065	.1496	.0889	.7423
.7835	.0512	.0441	.0390	.0440	.0797	.2640	.2538	.2078	.1483	.0863	.7835
.8247	.0499	.0441	.0364	.0440	.0797	.2640	.2512	.2078	.1444	.0863	.8247
.8660	.0538	.0480	.0416	.0505	.0849	.2601	.2499	.2052	.1457	.0928	.8660
.9072	.0512	.0441	.0403	.0505	.0823	.2627	.2486	.2039	.1522	.0928	.9072
.9485	.0525	.0493	.0468	.0544	.0875	.2627	.2512	.2078	.1522	.0928	.9485
.9897	.0499	.0493	.0455	.0518	.0849	.2588	.2447	.2052	.1496	.0915	.9897
1.0309	.0499	.0493	.0481	.0518	.0823	.2627	.2473	.2078	.1496	.0941	1.0309

(d) $\alpha = 12°$

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.5393	1.5431	1.5479	1.5511	1.5502	1.5393	1.5431	1.5479	1.5511	1.5502	.0000
.0206	1.3344	1.3496	1.3771	1.4259	1.4781	1.6304	1.6228	1.5935	1.5511	1.4971	.0206
.0412	1.0195	1.0385	1.0886	1.1716	1.2733	1.5773	1.5583	1.5024	1.4145	1.3150	.0412
.0619	.6629	.6856	.7431	.8490	.9660	1.3762	1.3534	1.2746	1.1602	1.0343	.0619
.0825	.3024	.3176	.3749	.4809	.6170	1.0195	.9930	.9026	.7731	.6284	.0825
.1031	.0368	.0558	.1016	.1811	.2908	.6856	.6591	.5685	.4505	.3250	.1031
.1237	-.1491	-.1377	-.1072	-.0504	.0253	.3366	.3138	.2496	.1583	.0632	.1237
.1443	-.1757	-.1643	-.1338	-.0770	-.0050	.2645	.2455	.1813	.0938	.0063	.1443
.1649	-.1605	-.1491	-.1186	-.0618	.0177	.3290	.2986	.2306	.1394	.0405	.1649
.1856	-.1339	-.1263	-.0996	-.0428	.0405	.3479	.3176	.2496	.1583	.0595	.1856
.2062	-.1112	-.1112	-.0844	-.0314	.0519						.2062
.2474	-.0947	-.0896	-.0647	-.0146	.0614	.3646	.3371	.2684	.1753	.0778	.2474
.2887	-.0726	-.0688	-.0504	-.0081	.0627	.3567	.3280	.2606	.1688	.0739	.2887
.3299	-.0441	-.0519	-.0439	-.0107	.0575	.3541	.3254	.2593	.1649	.0739	.3299
.3711	-.0246	-.0429	-.0413	-.0107	.0562	.3580	.3241	.2567	.1623	.0687	.3711
.4124	-.0117	-.0273	-.0349	-.0120	.0523	.3580	.3254	.2606	.1636	.0687	.4124
.4536	.0000	-.0065	-.0323	-.0120	.0485	.3528	.3228	.2541	.1583	.0648	.4536
.4948	.0104	-.0000	-.0297	-.0120	.0485	.3541	.3241	.2541	.1583	.0635	.4948
.5361	.0169	.0026	-.0284	-.0159	.0446	.3554	.3241	.2528	.1583	.0635	.5361
.5773	.0234	.0103	-.0206	-.0120	.0485	.3541	.3241	.2489	.1544	.0596	.5773
.6186	.0221	.0090	-.0206	-.0198	.0381	.3541	.3228	.2489	.1544	.0557	.6186
.6598	.0208	.0090	-.0206	-.0237	.0316	.3502	.3202	.2489	.1531	.0519	.6598
.7010	.0221	.0103	-.0193	-.0224	.0342	.3502	.3202	.2515	.1492	.0519	.7010
.7423	.0273	.0168	-.0089	-.0146	.0420	.3541	.3215	.2528	.1505	.0583	.7423
.7835	.0247	.0168	-.0063	-.0146	.0394	.3515	.3189	.2515	.1557	.0570	.7835
.8247	.0234	.0155	-.0024	-.0133	.0407	.3502	.3163	.2541	.1531	.0544	.8247
.8660	.0260	.0207	.0015	-.0107	.0420	.3489	.3163	.2541	.1518	.0544	.8660
.9072	.0247	.0181	.0002	-.0133	.0381	.3476	.3189	.2554	.1492	.0506	.9072
.9485	.0273	.0207	.0028	-.0107	.0394	.3502	.3228	.2554	.1492	.0493	.9485
.9897	.0260	.0194	.0002	-.0107	.0355	.3463	.3215	.2528	.1492	.0493	.9897
1.0309	.0273	.0181	.0002	-.0081	.0355	.3476	.3228	.2541	.1518	.0544	1.0309

TABLE III.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT $M_\infty = 2.30$

(a) $\alpha = 0°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6832	1.6834	1.6829	1.6817	1.6818	1.6832	1.6834	1.6829	1.6817	1.6818	.0000
.0206	1.6034	1.6059	1.6054	1.5997	1.6044	1.6222	1.6223	1.6219	1.6138	1.6208	.0206
.0412	1.3780	1.3805	1.3777	1.3748	1.3769	1.4132	1.4087	1.4106	1.4005	1.4050	.0412
.0619	1.0494	1.0518	1.0538	1.0491	1.0484	1.1104	1.1058	1.1031	1.0983	1.0977	.0619
.0825	.6761	.6785	.6806	.6742	.6754	.6784	.6738	.6736	.6719	.6707	.0825
.1031	.3450	.3474	.3426	.3462	.3423	.3615	.3592	.3590	.3555	.3563	.1031
.1237	.0821	.0845	.0820	.0814	.0819	.1103	.1103	.1079	.1095	.1053	.1237
.1443	.0422	.0422	.0421	.0416	.0396	.0398	.0399	.0374	.0392	.0373	.1443
.1649	.0610	.0610	.0609	.0627	.0584	.0610	.0586	.0562	.0533	.0560	.1649
.1856	.0704	.0704	.0727	.0697	.0678	.0657	.0657	.0609	.0650	.0607	.1856
.2062	.0774	.0774	.0773	.0767	.0748	.0845	.0845	.0797	.0767	.0795	.2062
.2474	.0868	.0868	.0880	.0874	.0866	.0923	.0899	.0887	.0885	.0885	.2474
.2887	.0892	.0892	.0904	.0897	.0890	.0946	.0934	.0911	.0908	.0909	.2887
.3299	.0951	.0962	.0962	.0956	.0948	.0969	.0969	.0957	.0955	.0955	.3299
.3711	.0986	.0986	.0986	.0991	.0960	.1004	.0981	.0992	.0978	.0990	.3711
.4124	.0974	.0974	.0974	.0967	.0960	.1074	.1062	.1062	.1048	.1048	.4124
.4536	.0974	.0974	.0974	.0967	.0972	.1027	.1016	.1016	.1001	.1002	.4536
.4948	.1009	.0986	.0986	.1014	.1019	.1051	.1039	.1027	.1025	.1048	.4948
.5361	.1009	.0986	.1009	.1026	.1030	.1074	.1074	.1051	.1071	.1072	.5361
.5773	.1068	.1068	.1091	.1108	.1124	.1086	.1074	.1074	.1083	.1083	.5773
.6186	.1045	.1045	.1068	.1085	.1101	.1086	.1086	.1097	.1095	.1106	.6186
.6598	.1045	.1068	.1080	.1096	.1101	.1086	.1086	.1109	.1106	.1118	.6598
.7010	.1056	.1080	.1103	.1096	.1101	.1086	.1097	.1120	.1118	.1130	.7010
.7423	.1139	.1150	.1162	.1167	.1171	.1121	.1132	.1155	.1153	.1153	.7423
.7835	.1150	.1162	.1162	.1167	.1171	.1132	.1132	.1167	.1164	.1165	.7835
.8247	.1139	.1150	.1150	.1155	.1183	.1132	.1132	.1155	.1153	.1153	.8247
.8660	.1174	.1174	.1197	.1213	.1206	.1144	.1132	.1155	.1176	.1188	.8660
.9072	.1150	.1150	.1185	.1178	.1148	.1144	.1132	.1144	.1188	.1176	.9072
.9485	.1174	.1185	.1232	.1178	.1148	.1179	.1156	.1190	.1188	.1188	.9485
.9897	.1162	.1174	.1197	.1143	.1124	.1144	.1132	.1155	.1141	.1141	.9897
1.0309	.1150	.1174	.1150	.1143	.1124	.1156	.1156	.1155	.1141	.1153	1.0309

(b) $\alpha = 4°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6727	1.6734	1.6758	1.6736	1.6762	1.6727	1.6734	1.6758	1.6736	1.6762	.0000
.0206	1.5437	1.5488	1.5608	1.5749	1.5988	1.6587	1.6569	1.6476	1.6289	1.6082	.0206
.0412	1.2809	1.2880	1.3073	1.3375	1.3714	1.4944	1.4642	1.4692	1.4362	1.3995	.0412
.0619	.9383	.9472	.9740	1.0061	1.0478	1.2105	1.2034	1.1805	1.1471	1.1017	.0619
.0825	.5535	.5618	.5914	.6301	.6749	.8022	.7898	.7604	.7217	.6703	.0825
.1031	.2508	.2563	.2745	.3034	.3396	.4644	.4514	.4294	.3927	.3560	.1031
.1237	.0209	.0213	.0374	.0543	.0817	.1875	.1788	.1595	.1342	.1075	.1237
.1443	-.0143	-.0116	.0022	.0167	.0395	.1054	.0989	.0820	.0637	.0371	.1443
.1649	-.0002	.0002	.0140	.0331	.0582	.1312	.1200	.1055	.0801	.0559	.1649
.1856	.0092	.0143	.0257	.0425	.0676	.1359	.1271	.1102	.0872	.0629	.1856
.2062	.0162	.0166	.0304	.0472	.0723	.1499	.1412	.1266	.1013	.0817	.2062
.2474	.0303	.0337	.0446	.0642	.0841	.1618	.1505	.1365	.1133	.0895	.2474
.2887	.0362	.0395	.0493	.0678	.0864	.1607	.1516	.1354	.1133	.0895	.2887
.3299	.0432	.0442	.0540	.0701	.0888	.1630	.1551	.1377	.1156	.0930	.3299
.3711	.0479	.0489	.0563	.0725	.0900	.1642	.1551	.1377	.1168	.0942	.3711
.4124	.0502	.0489	.0575	.0725	.0911	.1700	.1610	.1424	.1203	.0965	.4124
.4536	.0502	.0501	.0587	.0748	.0923	.1642	.1551	.1389	.1180	.0953	.4536
.4948	.0549	.0536	.0610	.0760	.0947	.1665	.1586	.1400	.1191	.0977	.4948
.5361	.0549	.0559	.0634	.0783	.0958	.1677	.1598	.1412	.1215	.1000	.5361
.5773	.0620	.0630	.0681	.0818	.1005	.1677	.1586	.1435	.1226	.1012	.5773
.6186	.0596	.0618	.0693	.0818	.1005	.1677	.1610	.1459	.1250	.1023	.6186
.6598	.0620	.0630	.0716	.0830	.1017	.1677	.1621	.1470	.1250	.1058	.6598
.7010	.0631	.0641	.0740	.0854	.1029	.1688	.1621	.1494	.1273	.1081	.7010
.7423	.0690	.0712	.0798	.0924	.1111	.1723	.1656	.1529	.1320	.1116	.7423
.7835	.0702	.0724	.0810	.0947	.1134	.1747	.1668	.1540	.1343	.1116	.7835
.8247	.0690	.0724	.0798	.0947	.1122	.1723	.1644	.1517	.1331	.1105	.8247
.8660	.0713	.0747	.0845	.0971	.1134	.1747	.1656	.1517	.1343	.1116	.8660
.9072	.0702	.0724	.0822	.0912	.1076	.1735	.1656	.1517	.1343	.1105	.9072
.9485	.0737	.0770	.0822	.0912	.1076	.1781	.1691	.1552	.1343	.1105	.9485
.9897	.0725	.0747	.0787	.0901	.1052	.1747	.1656	.1529	.1296	.1081	.9897
1.0309	.0737	.0747	.0787	.0901	.1040	.1735	.1656	.1517	.1296	.1081	1.0309

TABLE III.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT M_∞ = 2.30 - Concluded

(c) α = 8°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.6462	1.6443	1.6465	1.6493	1.6583	1.6462	1.6443	1.6465	1.6493	1.6583	.0000
.0206	1.4680	1.4777	1.4987	1.5298	1.5784	1.6814	1.6725	1.6512	1.6235	1.5878	.0206
.0412	1.1748	1.1915	1.2266	1.2814	1.3529	1.5665	1.5505	1.5128	1.4548	1.3882	.0412
.0619	.8206	.8396	.8794	.9533	1.0335	1.3178	1.2971	1.2454	1.1712	1.0852	.0619
.0825	.4453	.4596	.4994	.5736	.6647	.9191	.8936	.8348	.7564	.6647	.0825
.1031	.1709	.1804	.2132	.2643	.3359	.5767	.5534	.5017	.4283	.3547	.1031
.1237	-.0332	-.0237	-.0050	.0299	.0588	.2671	.2531	.2155	.1635	.1057	.1237
.1443	-.0636	-.0542	-.0378	-.0052	.0376	.1803	.1687	.1334	.0885	.0376	.1443
.1649	-.0496	-.0448	-.0237	.0159	.0564	.2108	.1945	.1592	.1119	.0564	.1649
.1856	-.0402	-.0331	-.0144	.0182	.0658	.2155	.2015	.1663	.1166	.0635	.1856
.2062	-.0332	-.0284	-.0097	.0252	.0729	.2295	.2109	.1780	.1330	.0799	.2062
.2474	-.0159	-.0110	.0066	.0379	.0796	.2402	.2224	.1876	.1370	.0885	.2474
.2887	-.0065	-.0028	.0113	.0402	.0796	.2379	.2189	.1841	.1347	.0851	.2887
.3299	.0005	.0030	.0148	.0402	.0796	.2402	.2212	.1841	.1359	.0851	.3299
.3711	.0087	.0077	.0171	.0425	.0819	.2367	.2178	.1829	.1335	.0851	.3711
.4124	.0111	.0112	.0195	.0425	.0808	.2448	.2236	.1841	.1359	.0874	.4124
.4536	.0146	.0136	.0206	.0425	.0808	.2367	.2178	.1817	.1312	.0839	.4536
.4948	.0204	.0171	.0242	.0449	.0843	.2367	.2189	.1829	.1335	.0839	.4948
.5361	.0216	.0218	.0288	.0472	.0855	.2390	.2201	.1841	.1347	.0862	.5361
.5773	.0286	.0335	.0370	.0543	.0902	.2402	.2224	.1841	.1359	.0885	.5773
.6186	.0286	.0323	.0347	.0496	.0866	.2425	.2236	.1864	.1405	.0932	.6186
.6598	.0322	.0323	.0335	.0496	.0866	.2425	.2247	.1887	.1428	.0920	.6598
.7010	.0357	.0323	.0335	.0496	.0866	.2437	.2271	.1934	.1428	.0920	.7010
.7423	.0415	.0382	.0406	.0566	.0937	.2483	.2306	.1957	.1440	.0932	.7423
.7835	.0404	.0382	.0406	.0554	.0902	.2483	.2306	.1957	.1428	.0932	.7835
.8247	.0404	.0382	.0394	.0519	.0855	.2460	.2294	.1922	.1417	.0909	.8247
.8660	.0415	.0429	.0406	.0519	.0855	.2472	.2294	.1922	.1417	.0885	.8660
.9072	.0404	.0405	.0382	.0496	.0831	.2460	.2294	.1945	.1393	.0885	.9072
.9485	.0427	.0405	.0382	.0507	.0843	.2507	.2341	.1957	.1393	.0885	.9485
.9897	.0427	.0382	.0382	.0496	.0831	.2472	.2306	.1899	.1370	.0874	.9897
1.0309	.0439	.0393	.0394	.0496	.0831	.2483	.2329	.1887	.1370	.0874	1.0309

(d) α = 12°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.5923	1.6007	1.6056	1.6096	1.6125	1.5923	1.6007	1.6056	1.6096	1.6125	.0000
.0206	1.3789	1.3965	1.4248	1.4781	1.5350	1.6814	1.6758	1.6502	1.6025	1.5491	.0206
.0412	1.0575	1.0820	1.1361	1.2200	1.3214	1.6205	1.6031	1.5422	1.4570	1.3519	.0412
.0619	.6916	.7205	.7887	.8868	1.0092	1.4047	1.3801	1.3028	1.1919	1.0632	.0619
.0825	.3445	.3637	.4154	.5184	.6477	1.0364	1.0045	.9154	.7906	.6501	.0825
.1031	.0959	.1102	.1548	.2274	.3262	.6893	.6595	.5797	.4668	.3473	.1031
.1237	-.0824	-.0658	-.0400	.0115	.0773	.3586	.3355	.2746	.1922	.1079	.1237
.1443	-.1082	-.0964	-.0705	-.0237	.0398	.2671	.2487	.1924	.1171	.0398	.1443
.1649	-.0965	-.0846	-.0564	-.0072	.0562	.3093	.2816	.2206	.1406	.0586	.1649
.1856	-.0871	-.0752	-.0494	-.0002	.0656	.3116	.2839	.2276	.1476	.0633	.1856
.2062	-.0777	-.0682	-.0423	.0045	.0703	.3257	.2980	.2370	.1594	.0797	.2062
.2474	-.0510	-.0505	-.0296	.0128	.0759	.3322	.3030	.2449	.1643	.0853	.2474
.2887	-.0393	-.0400	-.0226	.0140	.0759	.3275	.2972	.2367	.1573	.0794	.2887
.3299	-.0334	-.0329	-.0203	.0140	.0747	.3252	.2972	.2367	.1562	.0771	.3299
.3711	-.0276	-.0259	-.0203	.0104	.0712	.3240	.2937	.2344	.1527	.0736	.3711
.4124	-.0159	-.0224	-.0203	.0093	.0689	.3322	.2995	.2367	.1539	.0759	.4124
.4536	-.0088	-.0177	-.0179	.0057	.0665	.3252	.2949	.2321	.1504	.0701	.4536
.4948	-.0018	-.0095	-.0167	.0057	.0677	.3275	.2984	.2356	.1515	.0701	.4948
.5361	.0040	-.0036	-.0156	.0046	.0665	.3322	.2984	.2367	.1550	.0713	.5361
.5773	.0134	.0023	-.0109	.0069	.0689	.3310	.3007	.2391	.1550	.0689	.5773
.6186	.0122	.0011	-.0109	.0034	.0665	.3345	.3019	.2426	.1539	.0678	.6186
.6598	.0122	.0023	-.0109	.0022	.0642	.3345	.3007	.2426	.1539	.0678	.6598
.7010	.0134	.0058	-.0120	-.0013	.0583	.3357	.3019	.2426	.1539	.0654	.7010
.7423	.0193	.0105	-.0085	-.0001	.0606	.3380	.3054	.2449	.1539	.0643	.7423
.7835	.0193	.0093	-.0097	-.0013	.0571	.3415	.3042	.2449	.1515	.0620	.7835
.8247	.0193	.0082	-.0097	-.0025	.0560	.3368	.3042	.2414	.1492	.0608	.8247
.8660	.0193	.0093	-.0074	-.0025	.0571	.3392	.3089	.2414	.1480	.0608	.8660
.9072	.0181	.0082	-.0085	-.0036	.0548	.3403	.3112	.2402	.1480	.0608	.9072
.9485	.0193	.0093	-.0062	-.0036	.0560	.3473	.3147	.2414	.1480	.0596	.9485
.9897	.0181	.0093	-.0085	-.0048	.0524	.3415	.3089	.2379	.1469	.0608	.9897
1.0309	.0204	.0117	-.0062	-.0025	.0524	.3438	.3065	.2367	.1469	.0620	1.0309

TABLE IV.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT M_∞ = 2.96

(a) α = 0°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.7269	1.7258	1.7307	1.7303	1.7285	1.7269	1.7258	1.7307	1.7303	1.7285	.0000
.0206	1.6439	1.6399	1.6448	1.6418	1.6427	1.6688	1.6649	1.6642	1.6639	1.6621	.0206
.0412	1.4031	1.4073	1.4036	1.4065	1.4049	1.4474	1.4461	1.4479	1.4452	1.4436	.0412
.0619	1.0683	1.0722	1.0708	1.0715	1.0703	1.1320	1.1359	1.1318	1.1324	1.1284	.0619
.0825	.6837	.6817	.6799	.6840	.6832	.6948	.6955	.6882	.6923	.6887	.0825
.1031	.3655	.3632	.3665	.3657	.3679	.3821	.3853	.3832	.3850	.3817	.1031
.1237	.1220	.1250	.1225	.1248	.1245	.1469	.1499	.1475	.1470	.1494	.1237
.1443	.0777	.0779	.0782	.0805	.0803	.0777	.0807	.0754	.0805	.0803	.1443
.1649	.0805	.0834	.0865	.0861	.0886	.0888	.0862	.0865	.0861	.0858	.1649
.1856	.0805	.0862	.0865	.0861	.0886	.0888	.0862	.0865	.0861	.0858	.1856
.2062	.0805	.0862	.0865	.0861	.0886						.2062
.2474	.0874	.0890	.0874	.0873	.0873	.0910	.0967	.0954	.0952	.0953	.2474
.2887	.0861	.0862	.0860	.0859	.0859	.0869	.0912	.0913	.0911	.0911	.2887
.3299	.0833	.0849	.0846	.0845	.0845	.0869	.0912	.0899	.0897	.0898	.3299
.3711	.0833	.0835	.0846	.0845	.0859	.0841	.0898	.0885	.0884	.0884	.3711
.4124	.0833	.0835	.0833	.0831	.0845	.0869	.0912	.0899	.0911	.0911	.4124
.4536	.0833	.0835	.0833	.0831	.0845	.0841	.0898	.0885	.0897	.0884	.4536
.4948	.0833	.0849	.0833	.0831	.0845	.0855	.0898	.0899	.0897	.0898	.4948
.5361	.0847	.0862	.0846	.0845	.0859	.0869	.0912	.0913	.0911	.0898	.5361
.5773	.0874	.0876	.0874	.0873	.0887	.0883	.0926	.0913	.0911	.0911	.5773
.6186	.0874	.0890	.0888	.0887	.0887	.0897	.0939	.0926	.0925	.0925	.6186
.6598	.0888	.0890	.0888	.0887	.0887	.0897	.0953	.0940	.0939	.0939	.6598
.7010	.0888	.0904	.0902	.0900	.0915	.0910	.0967	.0954	.0952	.0953	.7010
.7423	.0916	.0918	.0930	.0928	.0942	.0924	.0981	.0968	.0966	.0966	.7423
.7835	.0930	.0932	.0943	.0942	.0942	.0924	.0981	.0981	.0980	.0980	.7835
.8247	.0944	.0932	.0943	.0956	.0956	.0938	.0994	.0995	.0980	.0994	.8247
.8660	.0944	.0959	.0957	.0956	.0970	.0938	.0994	.0995	.0994	.1008	.8660
.9072	.0944	.0959	.0957	.0956	.0970	.0952	.1008	.0995	.1007	.1008	.9072
.9485	.0944	.0959	.0957	.0970	.0970	.0952	.1008	.1009	.1021	.1021	.9485
.9897	.0944	.0959	.0957	.0970	.0970	.0952	.1008	.1009	.1021	.1035	.9897
1.0309	.0999	.1015	.1013	.1011	.1025	.0979	.1036	.1050	.1062	.1063	1.0309

(b) α = 4°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.7182	1.7201	1.7247	1.7193	1.7222	1.7182	1.7201	1.7247	1.7193	1.7222	.0000
.0206	1.5852	1.5844	1.6002	1.6141	1.6338	1.7071	1.7035	1.6888	1.6722	1.6531	.0206
.0412	1.3081	1.3130	1.3344	1.3649	1.3988	1.5353	1.5291	1.5061	1.4757	1.4347	.0412
.0619	.9535	.9641	.9940	1.0245	1.0699	1.2472	1.2383	1.2099	1.1712	1.1251	.0619
.0825	.5628	.5764	.6009	.6369	.6828	.8205	.8090	.7808	.7338	.6828	.0825
.1031	.2747	.2828	.3020	.3324	.3677	.4797	.4739	.4542	.4210	.3815	.1031
.1237	.0669	.0751	.0888	.1055	.1244	.2165	.2136	.1968	.1747	.1493	.1237
.1443	.0281	.0336	.0446	.0612	.0802	.1334	.1333	.1221	.1055	.0802	.1443
.1649	.0337	.0363	.0501	.0639	.0885	.1473	.1388	.1276	.1110	.0913	.1649
.1856	.0364	.0391	.0529	.0667	.0885	.1473	.1388	.1276	.1110	.0913	.1856
.2062	.0364	.0391	.0529	.0667	.0885						.2062
.2474	.0418	.0461	.0541	.0679	.0872	.1487	.1476	.1337	.1145	.0952	.2474
.2887	.0418	.0461	.0527	.0665	.0844	.1446	.1421	.1296	.1104	.0897	.2887
.3299	.0418	.0461	.0527	.0651	.0831	.1432	.1407	.1282	.1090	.0897	.3299
.3711	.0432	.0461	.0527	.0651	.0831	.1404	.1393	.1255	.1076	.0883	.3711
.4124	.0432	.0461	.0527	.0638	.0817	.1446	.1421	.1282	.1090	.0897	.4124
.4536	.0432	.0461	.0527	.0638	.0817	.1418	.1393	.1255	.1076	.0869	.4536
.4948	.0445	.0475	.0527	.0638	.0817	.1446	.1407	.1269	.1076	.0869	.4948
.5361	.0459	.0475	.0541	.0651	.0817	.1459	.1421	.1282	.1090	.0883	.5361
.5773	.0473	.0489	.0555	.0665	.0831	.1473	.1448	.1296	.1090	.0883	.5773
.6186	.0473	.0503	.0555	.0665	.0831	.1487	.1462	.1310	.1104	.0897	.6186
.6598	.0473	.0503	.0555	.0679	.0831	.1501	.1476	.1310	.1104	.0897	.6598
.7010	.0487	.0503	.0555	.0679	.0858	.1528	.1489	.1324	.1117	.0911	.7010
.7423	.0501	.0516	.0569	.0707	.0886	.1542	.1517	.1351	.1145	.0924	.7423
.7835	.0501	.0530	.0583	.0707	.0886	.1542	.1517	.1365	.1145	.0938	.7835
.8247	.0501	.0530	.0583	.0721	.0900	.1556	.1531	.1379	.1172	.0952	.8247
.8660	.0501	.0544	.0610	.0734	.0914	.1556	.1558	.1392	.1186	.0965	.8660
.9072	.0501	.0544	.0610	.0748	.0927	.1556	.1572	.1392	.1186	.0993	.9072
.9485	.0515	.0558	.0652	.0776	.0955	.1570	.1586	.1406	.1241	.1020	.9485
.9897	.0515	.0558	.0652	.0776	.0955	.1570	.1586	.1406	.1241	.1020	.9897
1.0309	.0598	.0641	.0693	.0817	.0997	.1597	.1599	.1434	.1268	.1048	1.0309

TABLE IV.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT M_∞ = 2.96 - Concluded

(c) α = 8°

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6836	1.6854	1.6888	1.6886	1.6933	1.6836	1.6854	1.6888	1.6886	1.6933	.0000
.0206	1.5034	1.5110	1.5338	1.5668	1.6103	1.7252	1.7186	1.6998	1.6637	1.6269	.0206
.0412	1.1956	1.2094	1.2514	1.3066	1.3779	1.6032	1.5940	1.5504	1.4921	1.4222	.0412
.0619	.8296	.8525	.8999	.9690	1.0570	1.3481	1.3312	1.2791	1.1987	1.1151	.0619
.0825	.4664	.4789	.5207	.5842	.6724	.9377	.9189	.8639	.7752	.6807	.0825
.1031	.2030	.2160	.2466	.2936	.3571	.5884	.5730	.5207	.4514	.3820	.1031
.1237	.0227	.0306	.0473	.0805	.1219	.2917	.2852	.2494	.1995	.1496	.1237
.1443	-.0133	-.0026	.0113	.0390	.0804	.2057	.1967	.1636	.1220	.0804	.1443
.1649	-.0078	.0030	.0196	.0473	.0859	.2140	.2050	.1774	.1331	.0915	.1649
.1856	-.0050	.0057	.0224	.0473	.0887	.2113	.2022	.1747	.1331	.0915	.1856
.2062	-.0022	.0057	.0252	.0473	.0887						.2062
.2474	.0085	.0112	.0250	.0499	.0846	.2208	.2092	.1790	.1378	.0953	.2474
.2887	.0113	.0139	.0250	.0471	.0818	.2139	.2037	.1721	.1309	.0884	.2887
.3299	.0127	.0139	.0236	.0444	.0791	.2139	.2009	.1708	.1295	.0871	.3299
.3711	.0154	.0153	.0236	.0430	.0777	.2126	.2009	.1694	.1268	.0830	.3711
.4124	.0154	.0153	.0236	.0416	.0749	.2181	.2051	.1721	.1282	.0830	.4124
.4536	.0168	.0153	.0223	.0402	.0749	.2153	.2037	.1694	.1254	.0802	.4536
.4948	.0168	.0167	.0223	.0402	.0749	.2194	.2051	.1708	.1254	.0802	.4948
.5361	.0182	.0167	.0223	.0402	.0735	.2222	.2078	.1721	.1254	.0802	.5361
.5773	.0182	.0167	.0223	.0388	.0749	.2249	.2106	.1735	.1254	.0802	.5773
.6186	.0182	.0167	.0223	.0402	.0749	.2277	.2133	.1749	.1282	.0802	.6186
.6598	.0168	.0167	.0209	.0402	.0749	.2291	.2147	.1763	.1282	.0816	.6598
.7010	.0182	.0167	.0223	.0416	.0763	.2318	.2174	.1790	.1295	.0830	.7010
.7423	.0196	.0222	.0278	.0444	.0804	.2332	.2188	.1818	.1323	.0857	.7423
.7835	.0210	.0250	.0278	.0444	.0804	.2346	.2202	.1831	.1337	.0871	.7835
.8247	.0237	.0250	.0278	.0444	.0804	.2346	.2215	.1845	.1350	.0871	.8247
.8660	.0265	.0264	.0292	.0458	.0818	.2360	.2215	.1873	.1378	.0884	.8660
.9072	.0265	.0250	.0278	.0444	.0804	.2373	.2229	.1886	.1392	.0884	.9072
.9485	.0279	.0264	.0292	.0458	.0804	.2415	.2243	.1900	.1392	.0898	.9485
.9897	.0279	.0250	.0278	.0430	.0804	.2401	.2229	.1886	.1392	.0898	.9897
1.0309	.0362	.0333	.0361	.0499	.0846	.2428	.2257	.1900	.1419	.0926	1.0309

(d) α = 12°

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6422	1.6394	1.6433	1.6474	1.6571	1.6422	1.6394	1.6433	1.6474	1.6571	.0000
.0206	1.4203	1.4290	1.4607	1.5062	1.5712	1.7337	1.7225	1.6959	1.6419	1.5878	.0206
.0412	1.0876	1.1051	1.1565	1.2405	1.3440	1.6727	1.6450	1.5852	1.4924	1.3884	.0412
.0619	.7077	.7340	.7996	.9000	1.0255	1.4508	1.4179	1.3390	1.2183	1.0892	.0619
.0825	.3749	.3935	.4400	.5290	.6542	1.0349	1.0275	.9352	.8086	.6681	.0825
.1031	.1448	.1554	.1883	.2550	.3495	.4331	.6731	.5949	.4820	.3716	.1031
.1237	-.0161	-.0025	.0168	.0584	.1195	.3832	.3630	.3017	.2245	.1472	.1237
.1443	-.0438	-.0329	-.0137	.0224	.0780	.2862	.2661	.2132	.1442	.0780	.1443
.1649	-.0383	-.0274	-.0081	.0280	.0835	.3000	.2800	.2298	.1581	.0891	.1649
.1856	-.0355	-.0246	-.0054	.0307	.0863	.2973	.2772	.2298	.1581	.0891	.1856
.2062	-.0327	-.0246	-.0026	.0307	.0863						.2062
.2474	-.0192	-.0164	-.0012	.0319	.0819	.3020	.2823	.2314	.1625	.0954	.2474
.2887	-.0136	-.0136	-.0012	.0278	.0791	.2993	.2768	.2231	.1529	.0858	.2887
.3299	-.0109	-.0122	-.0026	.0250	.0750	.3007	.2795	.2218	.1501	.0830	.3299
.3711	-.0067	-.0095	-.0053	.0222	.0708	.3020	.2781	.2204	.1474	.0775	.3711
.4124	-.0067	-.0095	-.0081	.0167	.0681	.3103	.2836	.2245	.1488	.0789	.4124
.4536	-.0053	-.0081	-.0095	.0139	.0653	.3089	.2823	.2218	.1446	.0720	.4536
.4948	-.0053	-.0095	-.0109	.0139	.0667	.3144	.2864	.2245	.1460	.0748	.4948
.5361	-.0053	-.0095	-.0095	.0126	.0639	.3213	.2905	.2272	.1460	.0720	.5361
.5773	-.0039	-.0081	-.0095	.0126	.0681	.3241	.2946	.2272	.1474	.0720	.5773
.6186	-.0026	-.0067	-.0109	.0112	.0639	.3268	.2974	.2341	.1501	.0734	.6186
.6598	.0002	-.0053	-.0109	.0084	.0639	.3282	.2974	.2341	.1501	.0734	.6598
.7010	.0016	-.0039	-.0123	.0084	.0625	.3296	.3001	.2355	.1529	.0734	.7010
.7423	.0058	-.0012	-.0095	.0098	.0653	.3337	.3042	.2382	.1556	.0748	.7423
.7835	.0071	-.0012	-.0109	.0084	.0639	.3351	.3042	.2410	.1570	.0748	.7835
.8247	.0071	-.0012	-.0109	.0056	.0639	.3323	.3042	.2410	.1556	.0734	.8247
.8660	.0085	.0002	-.0109	.0056	.0639	.3351	.3056	.2424	.1570	.0734	.8660
.9072	.0085	.0002	-.0109	.0043	.0625	.3364	.3070	.2424	.1584	.0734	.9072
.9485	.0099	.0016	-.0109	.0043	.0639	.3419	.3097	.2451	.1584	.0734	.9485
.9897	.0099	.0016	-.0109	.0029	.0612	.3392	.3097	.2451	.1597	.0734	.9897
1.0309	.0182	.0113	-.0026	.0098	.0667	.3406	.3111	.2492	.1611	.0762	1.0309

TABLE V.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT $M_\infty = 3.95$

(a) $\alpha = 0°$

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.7501	1.7531	1.7490	1.7435	1.7498	1.7501	1.7531	1.7490	1.7435	1.7498	.0000
.0206	1.6645	1.6638	1.6596	1.6578	1.6604	1.6823	1.6852	1.6811	1.6828	1.6855	.0206
.0412	1.4182	1.4207	1.4166	1.4151	1.4173	1.4539	1.4564	1.4559	1.4543	1.4566	.0412
.0619	1.0791	1.0775	1.0735	1.0759	1.0705	1.1327	1.1311	1.1307	1.1294	1.1348	.0619
.0825	.6830	.6806	.6768	.6796	.6772	.6865	.6878	.6875	.6867	.6879	.0825
.1031	.3689	.3696	.3659	.3690	.3661	.3867	.3875	.3838	.3833	.3876	.1031
.1237	.1476	.1480	.1443	.1512	.1516	.1690	.1658	.1658	.1655	.1695	.1237
.1443	.0976	.0943	.0979	.0977	.1015	.0976	.0979	.0979	.0977	.1015	.1443
.1649	.0976	.0943	.0979	.0977	.0979	.0976	.0979	.0979	.0977	.1015	.1649
.1856	.0940	.0908	.0943	.0941	.0979	.0940	.0943	.0943	.0941	.0979	.1856
.2062	.0940	.0872	.0943	.0905	.0944						.2062
.2474	.0887	.0905	.0903	.0885	.0872	.0926	.0929	.0926	.0944	.0933	.2474
.2887	.0815	.0834	.0831	.0814	.0800	.0837	.0840	.0855	.0855	.0844	.2887
.3299	.0780	.0798	.0778	.0778	.0764	.0802	.0805	.0802	.0802	.0808	.3299
.3711	.0762	.0780	.0760	.0742	.0729	.0749	.0769	.0767	.0767	.0755	.3711
.4124	.0726	.0745	.0742	.0724	.0711	.0749	.0751	.0749	.0767	.0755	.4124
.4536	.0708	.0727	.0724	.0724	.0693	.0713	.0716	.0731	.0731	.0720	.4536
.4948	.0708	.0727	.0707	.0707	.0675	.0713	.0716	.0714	.0714	.0720	.4948
.5361	.0708	.0727	.0707	.0707	.0675	.0696	.0716	.0714	.0714	.0702	.5361
.5773	.0708	.0727	.0724	.0707	.0675	.0696	.0716	.0714	.0714	.0702	.5773
.6186	.0708	.0727	.0724	.0707	.0675	.0696	.0716	.0714	.0714	.0720	.6186
.6598	.0708	.0727	.0724	.0707	.0675	.0713	.0716	.0714	.0714	.0720	.6598
.7010	.0708	.0745	.0724	.0724	.0693	.0713	.0716	.0714	.0731	.0737	.7010
.7423	.0726	.0745	.0742	.0742	.0711	.0713	.0716	.0731	.0749	.0737	.7423
.7835	.0744	.0763	.0742	.0742	.0711	.0731	.0734	.0731	.0749	.0755	.7835
.8247	.0744	.0780	.0760	.0742	.0729	.0731	.0734	.0749	.0767	.0755	.8247
.8660	.0762	.0780	.0778	.0760	.0729	.0731	.0751	.0749	.0767	.0773	.8660
.9072	.0762	.0798	.0778	.0778	.0729	.0749	.0751	.0767	.0784	.0773	.9072
.9485	.0780	.0816	.0796	.0778	.0747	.0749	.0769	.0784	.0784	.0791	.9485
.9897	.0797	.0816	.0796	.0778	.0764	.0749	.0769	.0784	.0802	.0808	.9897
1.0309	.0940	.0959	.0938	.0920	.0907	.0837	.0858	.0855	.0873	.0880	1.0309

(b) $\alpha = 4°$

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.7374	1.7388	1.7450	1.7393		1.7374	1.7388	1.7450	1.7393		.0000
.0206	1.5984	1.6066	1.6161	1.6321		1.7267	1.7245	1.7127	1.6929		.0206
.0412	1.3131	1.3241	1.3440	1.3746		1.5484	1.5458	1.5266	1.4890		.0412
.0619	.9495	.9595	.9860	1.0206		1.2490	1.2383	1.2151	1.1743		.0619
.0825		.5770	.5994	.6272		.8104	.7986	.7712	.7309		.0825
.1031	.2899	.2945	.3130	.3340		.4789	.4733	.4526	.4198		.1031
.1237	.0974	.1015	.1089	.1266		.2364	.2230	.2092	.1909		.1237
.1443	.0617	.0586	.0660	.0801		.1509	.1480	.1340	.1158		.1443
.1649	.0582	.0586	.0660	.0801		.1509	.1480	.1340	.1158		.1649
.1856	.0582	.0550	.0624	.0765		.1437	.1408	.1304	.1123		.1856
.2062	.0546	.0550	.0624	.0765							.2062
.2474	.0546	.0566	.0638	.0745		.1406	.1373	.1266	.1106		.2474
.2887	.0492	.0513	.0584	.0673		.1300	.1266	.1160	.1018		.2887
.3299	.0457	.0477	.0549	.0638		.1265	.1213	.1124	.0964		.3299
.3711	.0439	.0459	.0513	.0602		.1211	.1177	.1089	.0929		.3711
.4124	.0403	.0424	.0477	.0584		.1211	.1177	.1071	.0929		.4124
.4536	.0386	.0406	.0477	.0566		.1194	.1160	.1036	.0893		.4536
.4948	.0386	.0388	.0459	.0548		.1194	.1160	.1053	.0893		.4948
.5361	.0368	.0388	.0459	.0548		.1211	.1160	.1053	.0876		.5361
.5773	.0386	.0388	.0459	.0548		.1211	.1177	.1053	.0893		.5773
.6186	.0368	.0388	.0441	.0548		.1229	.1177	.1053	.0893		.6186
.6598	.0368	.0388	.0441	.0548		.1229	.1195	.1071	.0893		.6598
.7010	.0386	.0388	.0459	.0548		.1247	.1195	.1071	.0911		.7010
.7423	.0386	.0406	.0459	.0566		.1282	.1213	.1089	.0929		.7423
.7835	.0386	.0406	.0459	.0566		.1282	.1231	.1106	.0929		.7835
.8247	.0386	.0424	.0459	.0566		.1300	.1248	.1124	.0947		.8247
.8660	.0403	.0424	.0477	.0566		.1318	.1266	.1142	.0947		.8660
.9072	.0403	.0424	.0477	.0566		.1318	.1284	.1160	.0964		.9072
.9485	.0421	.0424	.0477	.0584		.1336	.1302	.1177	.0982		.9485
.9897	.0421	.0424	.0477	.0584		.1336	.1302	.1177	.1000		.9897
1.0309	.0564	.0602	.0656	.0745		.1406	.1373	.1266	.1071		1.0309

TABLE V.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT $M_\infty = 3.95$ - Concluded

(c) $\alpha = 8°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.7020	1.7030	1.7072	1.7072		1.7020	1.7030	1.7072	1.7072		.0000
.0206	1.5198	1.5242	1.5498	1.5856		1.7449	1.7387	1.7143	1.6857		.0206
.0412	1.2054	1.2168	1.2494	1.3102		1.6270	1.6100	1.5641	1.5033		.0412
.0619	.8195	.8379	.8883	.9598		1.3519	1.3348	1.2816	1.1994		.0619
.0825	.4694	.4804	.5235	.5843		.9303	.9094	.8489	.7667		.0825
.1031	.2193	.2302	.2553	.2982		.5801	.5590	.5199	.4484		.1031
.1237	.0549	.0622	.0801	.1051		.3015	.2909	.2589	.2124		.1237
.1443	.0228	.0264	.0408	.0622		.2086	.1980	.1731	.1373		.1443
.1649	.0228	.0228	.0408	.0622		.2086	.1980	.1731	.1373		.1649
.1856	.0228	.0228	.0372	.0586		.2014	.1908	.1695	.1302		.1856
.2062	.0228	.0228	.0372	.0551							.2062
.2474	.0261	.0299	.0389	.0570		.1970	.1887	.1639	.1286		.2474
.2887	.0243	.0263	.0354	.0516		.1882	.1780	.1532	.1180		.2887
.3299	.0225	.0245	.0300	.0462		.1847	.1745	.1497	.1126		.3299
.3711	.0207	.0209	.0282	.0427		.1829	.1727	.1461	.1091		.3711
.4124	.0189	.0209	.0246	.0391		.1847	.1745	.1479	.1091		.4124
.4536	.0189	.0191	.0228	.0373		.1847	.1727	.1443	.1055		.4536
.4948	.0172	.0174	.0211	.0355		.1882	.1745	.1461	.1055		.4948
.5361	.0172	.0174	.0193	.0337		.1900	.1780	.1479	.1055		.5361
.5773	.0172	.0174	.0193	.0337		.1935	.1798	.1479	.1055		.5773
.6186	.0172	.0156	.0193	.0319		.1970	.1834	.1497	.1073		.6186
.6598	.0154	.0156	.0193	.0319		.1988	.1851	.1514	.1091		.6598
.7010	.0154	.0156	.0193	.0319		.2006	.1887	.1550	.1091		.7010
.7423	.0154	.0156	.0193	.0337		.2059	.1922	.1568	.1126		.7423
.7835	.0154	.0156	.0193	.0319		.2077	.1940	.1585	.1126		.7835
.8247	.0154	.0156	.0193	.0319		.2077	.1958	.1621	.1144		.8247
.8660	.0154	.0156	.0193	.0337		.2094	.1976	.1639	.1162		.8660
.9072	.0136	.0156	.0193	.0319		.2130	.1993	.1656	.1180		.9072
.9485	.0154	.0156	.0193	.0337		.2148	.2011	.1674	.1180		.9485
.9897	.0154	.0174	.0193	.0355		.2148	.2011	.1692	.1197		.9897
1.0309	.0332	.0352	.0371	.0498		.2201	.2082	.1745	.1268		1.0309

(d) $\alpha = 12°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6859	1.6535	1.6607	1.6641		1.6859	1.6535	1.6607	1.6641		.0000
.0206	1.4289	1.4394	1.4747	1.5247		1.7501	1.7356	1.7072	1.6606		.0206
.0412	1.0863	1.1075	1.1672	1.2493		1.6788	1.6571	1.5999	1.4996		.0412
.0619	.7008	.7221	1.1493	.8989		1.4503	1.4216	1.3388	1.2172		.0619
.0825	.3796	.3973	.4520	.5306		1.0541	1.0183	.9312	.7988		.0825
.1031	.1619	.1690	.2088	.2696		.6901	.6614	.5879	.4806		.1031
.1237	.0227	.0298	.0551	.0872		.3796	.3617	.3125	.2374		.1237
.1443	-.0059	.0012	.0229	.0515		.2796	.2653	.2160	.1587		.1443
.1649	-.0059	.0012	.0229	.0515		.2796	.2653	.2160	.1587		.1649
.1856	-.0059	.0012	.0193	.0479		.2725	.2546	.2124	.1516		.1856
.2062	-.0059	.0012	.0193	.0443							.2062
.2474	.0048	.0065	.0192	.0443		.2696	.2520	.2082	.1497		.2474
.2887	.0048	.0065	.0139	.0371		.2608	.2431	.1975	.1373		.2887
.3299	.0030	.0047	.0103	.0318		.2626	.2431	.1957	.1337		.3299
.3711	.0030	.0029	.0085	.0282		.2626	.2431	.1940	.1302		.3711
.4124	.0030	.0029	.0050	.0246		.2714	.2502	.1975	.1302		.4124
.4536	.0012	.0011	.0014	.0211		.2714	.2520	.1957	.1284		.4536
.4948	.0012	.0011	-.0004	.0193		.2785	.2555	.1993	.1284		.4948
.5361	.0012	.0011	-.0004	.0175		.2856	.2608	.2011	.1302		.5361
.5773	.0012	-.0006	-.0022	.0157		.2891	.2662	.2064	.1302		.5773
.6186	-.0006	-.0024	-.0040	.0157		.2944	.2715	.2099	.1337		.6186
.6598	-.0006	-.0042	-.0058	.0157		.2962	.2732	.2117	.1337		.6598
.7010	-.0006	-.0042	-.0058	.0121		.2997	.2768	.2153	.1355		.7010
.7423	-.0006	-.0042	-.0058	.0121		.3051	.2803	.2188	.1373		.7423
.7835	-.0006	-.0042	-.0058	.0121		.3068	.2821	.2223	.1390		.7835
.8247	-.0006	-.0042	-.0058	.0121		.3068	.2839	.2223	.1426		.8247
.8660	.0012	-.0042	-.0076	.0121		.3068	.2856	.2259	.1426		.8660
.9072	.0012	-.0024	-.0076	.0121		.3104	.2874	.2259	.1443		.9072
.9485	.0030	-.0006	-.0076	.0121		.3121	.2892	.2294	.1443		.9485
.9897	.0030	.0011	-.0076	.0121		.3121	.2892	.2294	.1461		.9897
1.0309	.0226	.0207	.0121	.0282		.3157	.2927	.2348	.1514		1.0309

TABLE VI.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT M_∞ = 4.63

(a) α = 0°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.7652	1.7629	1.7558	1.7631	1.7631	1.7652	1.7629	1.7558	1.7631	1.7631	.0000
.0206	1.6695	1.6719	1.6692	1.6721	1.6718	1.7014	1.6992	1.6966	1.6903	1.6992	.0206
.0412	1.4189	1.4170	1.4141	1.4172	1.4254	1.4781	1.4716	1.4733	1.4627	1.4710	.0412
.0619	1.0680	1.0620	1.0678	1.0667	1.0741	1.1455	1.1439	1.1362	1.1396	1.1334	.0619
.0825	.6716	.6752	.6715	.6753	.6725	.7035	.6979	.6942	.6889	.6908	.0825
.1031	.3663	.3703	.3662	.3703	.3714	.3981	.4021	.3935	.3931	.3896	.1031
.1237	.1521	.1518	.1521	.1518	.1569	.1749	.1791	.1703	.1746	.1706	.1237
.1443	.1065	.1017	.1019	.1018	.1113	.1111	.1063	.1065	.1063	.1067	.1443
.1649	.1020	.0972	.1019	.1018	.1067	.1111	.1063	.1019	.1063	.1022	.1649
.1856	.0928	.0972	.0928	.0927	.0976	.1065	.0972	.0974	.1018	.0976	.1856
.2062	.0883	.0926	.0883	.0927	.0931						.2062
.2474	.0883	.0905	.0882	.0884	.0885	.0907	.0928	.0905	.0905	.0907	.2474
.2887	.0791	.0814	.0814	.0816	.0816	.0816	.0837	.0814	.0814	.0816	.2887
.3299	.0746	.0768	.0768	.0747	.0771	.0770	.0768	.0746	.0746	.0748	.3299
.3711	.0700	.0723	.0723	.0702	.0725	.0702	.0723	.0700	.0700	.0702	.3711
.4124	.0678	.0700	.0700	.0679	.0702	.0702	.0700	.0677	.0678	.0679	.4124
.4536	.0655	.0677	.0677	.0656	.0679	.0656	.0654	.0655	.0655	.0634	.4536
.4948	.0632	.0654	.0655	.0633	.0657	.0633	.0654	.0632	.0632	.0634	.4948
.5361	.0632	.0654	.0655	.0633	.0657	.0633	.0632	.0632	.0609	.0634	.5361
.5773	.0632	.0654	.0655	.0656	.0657	.0611	.0632	.0632	.0609	.0611	.5773
.6186	.0632	.0632	.0655	.0633	.0657	.0611	.0632	.0609	.0609	.0611	.6186
.6598	.0632	.0632	.0655	.0633	.0657	.0611	.0632	.0609	.0609	.0611	.6598
.7010	.0632	.0632	.0655	.0656	.0657	.0611	.0632	.0609	.0609	.0634	.7010
.7423	.0632	.0654	.0655	.0656	.0679	.0611	.0632	.0632	.0632	.0634	.7423
.7835	.0655	.0654	.0655	.0679	.0679	.0633	.0632	.0632	.0632	.0634	.7835
.8247	.0655	.0654	.0655	.0679	.0679	.0633	.0654	.0632	.0632	.0634	.8247
.8660	.0655	.0654	.0677	.0679	.0702	.0633	.0654	.0632	.0655	.0657	.8660
.9072	.0655	.0677	.0677	.0679	.0702	.0656	.0654	.0655	.0655	.0657	.9072
.9485	.0655	.0677	.0677	.0679	.0702	.0656	.0677	.0655	.0655	.0679	.9485
.9897	.0678	.0677	.0700	.0702	.0702	.0656	.0677	.0655	.0678	.0679	.9897
1.0309	.0883	.0882	.0882	.0907	.0930	.0793	.0791	.0791	.0791	.0816	1.0309

(b) α = 4°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.7469	1.7447	1.7447	1.7491	1.7497	1.7469	1.7447	1.7447	1.7491	1.7497	.0000
.0206	1.6057	1.6036	1.6127	1.6351	1.6587	1.7424	1.7310	1.7174	1.6989	1.6769	.0206
.0412	1.3095	1.3123	1.3351	1.3705	1.4083	1.5692	1.5535	1.5308	1.4982	1.4584	.0412
.0619	.9358	.9482	.9710	1.0192	1.0669	1.2639	1.2486	1.2167	1.1788	1.1261	.0619
.0825	.5622	.5705	.5933	.6268	.6708	.8219	.8117	.7798	.7317	.6890	.0825
.1031	.2888	.2883	.3065	.2892	.3704	.4893	.4886	.4567	.4261	.3886	.1031
.1237	.1065	.1063	.1154	.1295	.1564	.2432	.2383	.2155	.1980	.1746	.1237
.1443	.0655	.0699	.0744	.0885	.1109	.1612	.1564	.1427	.1250	.1109	.1443
.1649	.0655	.0653	.0699	.0839	.1063	.1566	.1518	.1382	.1204	.1063	.1649
.1856	.0609	.0608	.0653	.0793	.1018	.1475	.1427	.1291	.1113	.1018	.1856
.2062	.0564	.0608	.0608	.0793	.0927						.2062
.2474	.0564	.0586	.0632	.0727	.0883	.1361	.1317	.1201	.1067	.0906	.2474
.2887	.0495	.0518	.0564	.0658	.0814	.1270	.1203	.1110	.0953	.0814	.2887
.3299	.0450	.0472	.0518	.0612	.0769	.1201	.1157	.1042	.0907	.0746	.3299
.3711	.0404	.0449	.0472	.0567	.0723	.1156	.1112	.0996	.0862	.0701	.3711
.4124	.0381	.0404	.0450	.0544	.0678	.1156	.1112	.0974	.0839	.0655	.4124
.4536	.0359	.0381	.0404	.0521	.0678	.1133	.1066	.0951	.0793	.0632	.4536
.4948	.0359	.0358	.0404	.0498	.0655	.1133	.1066	.0951	.0793	.0632	.4948
.5361	.0336	.0358	.0381	.0475	.0632	.1133	.1066	.0951	.0793	.0609	.5361
.5773	.0336	.0358	.0381	.0475	.0632	.1156	.1066	.0951	.0771	.0609	.5773
.6186	.0336	.0336	.0381	.0475	.0632	.1156	.1089	.0951	.0771	.0609	.6186
.6598	.0336	.0336	.0381	.0475	.0632	.1179	.1089	.0974	.0793	.0609	.6598
.7010	.0336	.0336	.0359	.0475	.0632	.1179	.1112	.0974	.0793	.0609	.7010
.7423	.0336	.0336	.0359	.0475	.0655	.1201	.1135	.0996	.0816	.0609	.7423
.7835	.0336	.0336	.0381	.0475	.0655	.1224	.1157	.0996	.0816	.0632	.7835
.8247	.0336	.0336	.0359	.0475	.0655	.1224	.1180	.1019	.0839	.0632	.8247
.8660	.0336	.0336	.0359	.0475	.0678	.1247	.1180	.1019	.0839	.0632	.8660
.9072	.0336	.0336	.0359	.0475	.0678	.1270	.1203	.1042	.0862	.0655	.9072
.9485	.0336	.0336	.0381	.0475	.0678	.1293	.1203	.1065	.0862	.0655	.9485
.9897	.0313	.0336	.0381	.0498	.0701	.1293	.1226	.1065	.0885	.0678	.9897
1.0309	.0541	.0563	.0609	.0704	.0906	.1406	.1317	.1179	.0976	.0792	1.0309

TABLE VI.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 1 AT $M_\infty = 4.63$.- Concluded

(c) $\alpha = 8°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.7123	1.7083	1.7176	1.7018	1.7224	1.7123	1.7083	1.7176	1.7018	1.7224	.0000
.0206	1.5208	1.5217	1.5538	1.5710	1.6314	1.7580	1.7447	1.7267	1.6747	1.6541	.0206
.0412	1.1969	1.1986	1.2488	1.3003	1.3901	1.6394	1.6264	1.5811	1.4943	1.4356	.0412
.0619	.8137	.8208	.8756	.9439	1.0487	1.3748	1.3533	1.2989	1.1920	1.1124	.0619
.0825	.4671	.4704	.5205	.5785	.6617	.9506	.9209	.8574	.7635	.6754	.0825
.1031	.2207	.2292	.2611	.2988	.3658	.5948	.5796	.5296	.4522	.3840	.1031
.1237	.0611	.0699	.0881	.1093	.1519	.3120	.3020	.2656	.2176	.1701	.1237
.1443	.0383	.0380	.0563	.0732	.1063	.2207	.2110	.1837	.1409	.1109	.1443
.1649	.0337	.0335	.0517	.0687	.1018	.2162	.2064	.1792	.1364	.1063	.1649
.1856	.0246	.0335	.0472	.0642	.0972	.2070	.1928	.1700	.1319	.1018	.1856
.2062	.0246	.0335	.0426	.0642	.0927						.2062
.2474	.0291	.0336	.0450	.0632	.0883	.1930	.1839	.1568	.1225	.0927	.2474
.2887	.0268	.0290	.0404	.0541	.0814	.1839	.1748	.1454	.1111	.0813	.2887
.3299	.0246	.0267	.0359	.0495	.0746	.1793	.1680	.1408	.1065	.0745	.3299
.3711	.0223	.0245	.0313	.0473	.0701	.1771	.1657	.1363	.1019	.0699	.3711
.4124	.0200	.0222	.0267	.0404	.0655	.1793	.1680	.1363	.0997	.0676	.4124
.4536	.0177	.0176	.0267	.0382	.0632	.1793	.1680	.1340	.0974	.0653	.4536
.4948	.0154	.0176	.0245	.0359	.0609	.1816	.1702	.1363	.0974	.0631	.4948
.5361	.0154	.0154	.0222	.0359	.0609	.1862	.1725	.1363	.0974	.0608	.5361
.5773	.0154	.0154	.0199	.0359	.0609	.1884	.1748	.1386	.0974	.0608	.5773
.6186	.0154	.0154	.0199	.0336	.0609	.1930	.1793	.1408	.0974	.0608	.6186
.6598	.0132	.0131	.0176	.0313	.0609	.1953	.1816	.1431	.0974	.0608	.6598
.7010	.0132	.0131	.0176	.0313	.0609	.1998	.1862	.1454	.0997	.0608	.7010
.7423	.0132	.0131	.0176	.0313	.0609	.2021	.1907	.1500	.1019	.0631	.7423
.7835	.0132	.0131	.0176	.0313	.0609	.2067	.1930	.1523	.1042	.0631	.7835
.8247	.0109	.0108	.0176	.0313	.0609	.2089	.1953	.1545	.1042	.0631	.8247
.8660	.0109	.0108	.0176	.0313	.0632	.2112	.1953	.1545	.1065	.0631	.8660
.9072	.0109	.0108	.0154	.0313	.0632	.2135	.1998	.1568	.1088	.0631	.9072
.9485	.0109	.0108	.0176	.0313	.0632	.2181	.2021	.1591	.1088	.0653	.9485
.9897	.0109	.0108	.0154	.0313	.0632	.2181	.2021	.1614	.1111	.0653	.9897
1.0309	.0360	.0359	.0404	.0564	.0860	.2272	.2112	.1705	.1202	.0790	1.0309

(d) $\alpha = 12°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6583	1.6538	1.6583	1.6557	1.6724	1.6583	1.6538	1.6583	1.6557	1.6724	.0000
.0206	1.4262	1.4399	1.4717	1.5190	1.5813	1.7587	1.7448	1.7084	1.6557	1.6041	.0206
.0412	1.0758	1.0940	1.1531	1.2365	1.3491	1.7038	1.6720	1.6082	1.5053	1.3947	.0412
.0619	.6934	.7162	.7799	.8811	1.0214	1.4763	1.4444	1.3488	1.2183	1.0805	.0619
.0825	.3839	.3976	.4431	.5257	.6481	1.0712	.8118	.9346	.7945	.6617	.0825
.1031	.1655	.1746	.2064	.2660	.3567	.7071	.6752	.5933	.4847	.3795	.1031
.1237	.0380	.0927	.0608	.0928	.1519	.3976	.3703	.3111	.2432	.1701	.1237
.1443	.0107	.0972	.0289	.0609	.1063	.2929	.2702	.2201	.1612	.1063	.1443
.1649	.0107	.0972	.0244	.0564	.1018	.2884	.2656	.2155	.1566	.1063	.1649
.1856	.0062	.0972	.0244	.0564	.0972	.2747	.2611	.2110	.1521	.1018	.1856
.2062	.0062	.0972	.0244	.0473	.0927						.2062
.2474	.0109	.0154	.0245	.0495	.0860	.2617	.2435	.1995	.1407	.0862	.2474
.2887	.0109	.0131	.0222	.0427	.0792	.2548	.2367	.1881	.1293	.0748	.2887
.3299	.0109	.0108	.0153	.0359	.0723	.2548	.2344	.1859	.1247	.0702	.3299
.3711	.0086	.0063	.0131	.0313	.0678	.2571	.2367	.1836	.1202	.0634	.3711
.4124	.0063	.0063	.0108	.0268	.0655	.2685	.2435	.1881	.1202	.0611	.4124
.4536	.0063	.0040	.0062	.0245	.0609	.2730	.2481	.1881	.1179	.0588	.4536
.4948	.0040	.0040	.0040	.0222	.0609	.2776	.2549	.1904	.1179	.0565	.4948
.5361	.0040	.0017	.0017	.0199	.0587	.2844	.2595	.1950	.1202	.0565	.5361
.5773	.0040	.0017	-.0006	.0177	.0587	.2913	.2640	.1995	.1202	.0565	.5773
.6186	.0018	-.0006	-.0029	.0177	.0587	.2958	.2686	.2018	.1225	.0565	.6186
.6598	.0018	-.0006	-.0029	.0154	.0587	.3004	.2731	.2063	.1247	.0565	.6598
.7010	.0018	-.0029	-.0052	.0154	.0587	.3027	.2777	.2086	.1270	.0565	.7010
.7423	.0018	-.0029	-.0052	.0131	.0587	.3072	.2800	.2132	.1293	.0565	.7423
.7835	.0018	-.0029	-.0074	.0131	.0587	.3118	.2823	.2154	.1316	.0588	.7835
.8247	-.0005	-.0051	-.0074	.0131	.0609	.3141	.2845	.2177	.1316	.0588	.8247
.8660	-.0005	-.0051	-.0074	.0131	.0609	.3141	.2868	.2200	.1338	.0588	.8660
.9072	-.0005	-.0074	-.0074	.0131	.0609	.3164	.2891	.2223	.1338	.0588	.9072
.9485	-.0005	-.0074	-.0074	.0131	.0609	.3186	.2914	.2245	.1361	.0588	.9485
.9897	.0018	-.0074	-.0074	.0131	.0609	.3164	.2914	.2245	.1384	.0611	.9897
1.0309	.0291	.0222	.0199	.0359	.0814	.3232	.2982	.2336	.1475	.0725	1.0309

TABLE VII.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_{\infty} = 1.50$

(a) $\alpha = 0°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.5291	1.5230	1.5294	1.5293	1.5246	1.5291	1.5230	1.5294	1.5293	1.5246	.0000
.0223	1.4985	1.4925	1.4988	1.4948	1.4979	1.4985	1.4925	1.4988	1.4986	1.4979	.0223
.0446	1.4029	1.3972	1.4032	1.4029	1.4065	1.4106	1.4048	1.4108	1.4067	1.4065	.0446
.0670	1.2615	1.2561	1.2541	1.2573	1.2618	1.2576	1.2523	1.2541	1.2535	1.2504	.0670
.0893	1.0588	1.0541	1.0590	1.0581	1.0638	1.0741	1.0693	1.0705	1.0734	1.0638	.0893
.1116	.8906	.8825	.8870	.8896	.8924	.8791	.8749	.8793	.8781	.8733	.1116
.1339	.6956	.6919	.6958	.6981	.7057	.6918	.6919	.6920	.6904	.6905	.1339
.1563	.5235	.5203	.5237	.5257	.5305	.4930	.4936	.4969	.4989	.4925	.1563
.1786	.3668	.3640	.3708	.3686	.3706	.3591	.3602	.3631	.3610	.3591	.1786
.2009	.2483	.2458	.2522	.2499	.2525	.2483	.2458	.2484	.2461	.2449	.2009
.2232	.1145	.1162	.1184	.1197	.1268	.1183	.1162	.1146	.1158	.1154	.2232
.2455	.0227	.0208	.0266	.0277	.0316	-.0002	.0018	.0037	.0048	.0049	.2455
.2679	-.0614	-.0630	-.0613	-.0604	-.0598	-.0805	-.0821	-.0805	-.0795	-.0789	.2679
.2902	-.1570	-.1583	-.1569	-.1561	-.1550	-.1761	-.1774	-.1761	-.1753	-.1741	.2902
.3125	-.2220	-.2193	-.2181	-.2174	-.2160	-.2220	-.2232	-.2219	-.2212	-.2236	.3125
.3348	-.2220	-.2232	-.2219	-.2212	-.2198	-.2144	-.2155	-.2143	-.2136	-.2160	.3348
.3571	-.2067	-.2079	-.2066	-.2097	-.2045						.3571
.3795	-.1925	-.1948	-.1922	-.1927	-.1903	-.1853	-.1834	-.1860	-.1826	-.1795	.3795
.4018	-.1692	-.1702	-.1702	-.1707	-.1683	-.1685	-.1692	-.1705	-.1670	-.1652	.4018
.4241	-.1602	-.1624	-.1624	-.1616	-.1593	-.1516	-.1484	-.1523	-.1462	-.1458	.4241
.4464	-.1447	-.1456	-.1456	-.1460	-.1451	-.1425	-.1419	-.1445	-.1410	-.1394	.4464
.4688	-.1279	-.1301	-.1288	-.1292	-.1283	-.1282	-.1277	-.1290	-.1254	-.1251	.4688
.4911	-.1201	-.1223	-.1210	-.1214	-.1179	-.1152	-.1160	-.1173	-.1137	-.1083	.4911
.5134	-.1059	-.1094	-.1094	-.1084	-.1037	-.0996	-.0991	-.1004	-.0994	-.0928	.5134
.5357	-.1020	-.1042	-.1016	-.1019	-.1011	-.0957	-.0939	-.0965	-.0943	-.0928	.5357
.5580	-.0942	-.0964	-.0938	-.0942	-.0934	-.0892	-.0861	-.0887	-.0891	-.0863	.5580
.5804	-.0813	-.0835	-.0822	-.0825	-.0817	-.0827	-.0771	-.0823	-.0787	-.0759	.5804
.6027	-.0787	-.0770	-.0744	-.0773	-.0766	-.0710	-.0667	-.0732	-.0696	-.0656	.6027
.6250	-.0671	-.0692	-.0667	-.0682	-.0662	-.0684	-.0667	-.0706	-.0670	-.0630	.6250
.6473	-.0619	-.0615	-.0615	-.0630	-.0598	-.0606	-.0576	-.0602	-.0592	-.0565	.6473
.6696	-.0580	-.0589	-.0576	-.0579	-.0533	-.0502	-.0511	-.0511	-.0501	-.0475	.6696
.6920	-.0502	-.0511	-.0472	-.0475	-.0417	-.0450	-.0446	-.0446	-.0462	-.0358	.6920
.7143	-.0425	-.0434	-.0421	-.0397	-.0404	-.0385	-.0381	-.0407	-.0384	-.0320	.7143
.7366	.0752	.0770	.0654	.0537	.0578	.1681	.1655	.1552	.1527	.1414	.7366
.7589	.2887	.2880	.2880	.2858	.2879	.3149	.3173	.3160	.3139	.3148	.7589
.7813	.3585	.3592	.3631	.3597	.3590	.3903	.3952	.3887	.3892	.3912	.7813
.8036	.4310	.4330	.4317	.4310	.4301	.4578	.4575	.4548	.4542	.4533	.8036
.8259	.4724	.4718	.4692	.4699	.4727	.4916	.4912	.4899	.4854	.4843	.8259
.8482	.4840	.4822	.4783	.4790	.4805	.4968	.4964	.4951	.4919	.4895	.8482
.8705	.4814	.4796	.4731	.4751	.4766	.4929	.4912	.4912	.4880	.4869	.8705
.8929	.4736	.4718	.4679	.4661	.4689	.4747	.4743	.4743	.4724	.4688	.8929
.9152	.4568	.4537	.4511	.4505	.4598	.4591	.4600	.4600	.4594	.4571	.9152
.9375	.4478	.4447	.4408	.4414	.4430	.4474	.4471	.4484	.4464	.4442	.9375
.9598	.4348	.4304	.4304	.4297	.4288	.4357	.4367	.4367	.4347	.4326	.9598
.9821	.4258	.4265	.4226	.4207	.4197	.4214	.4224	.4211	.4230	.4196	.9821
1.0045	.4180	.4175	.4162	.4142	.4120	.4189	.4198	.4198	.4217	.4196	1.0045
1.0268	.4154	.4136	.4110	.4077	.4055	.4072	.4082	.4107	.4113	.4093	1.0268
1.0491	.4090	.4084	.4032	.4012	.4004	.4046	.4043	.4068	.4061	.4041	1.0491
1.0714	.3986	.3981	.3968	.3947	.3939	.3916	.3939	.3939	.3944	.3976	1.0714
1.0938	.3624	.3631	.3605	.3597	.3590	.3136	.3147	.3134	.3204	.3200	1.0938

TABLE VII.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 1.50$ - Continued

(b) $\alpha = 4°$

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.5214	1.5198	1.5252	1.5286	1.5211	1.5214	1.5198	1.5252	1.5286	1.5211	.0000
.0223	1.4526	1.4550	1.4679	1.4789	1.4906	1.5253	1.5198	1.5176	1.5095	1.4944	.0223
.0446	1.3303	1.3291	1.3455	1.3719	1.3954	1.4679	1.4588	1.4526	1.4292	1.4030	.0446
.0670	1.1659	1.1689	1.1926	1.2228	1.2545	1.3379	1.3291	1.3149	1.2878	1.2506	.0670
.0893	.9441	.9477	.9708	1.0088	1.0526	1.1735	1.1651	1.1467	1.1158	1.0716	.0893
.1116	.7721	.7799	.8064	.8406	.8850	.9900	.9783	.9632	.9285	.8735	.1116
.1339	.5847	.5854	.6115	.6495	.6907	.8027	.7990	.7759	.7412	.6907	.1339
.1563	.4127	.4176	.4432	.4774	.5231	.6191	.6083	.5885	.5462	.4926	.1563
.1786	.2521	.2575	.2827	.3245	.3669	.4853	.4749	.4509	.4125	.3593	.1786
.2009	.1412	.1469	.1718	.2060	.2450	.3591	.3528	.3285	.2978	.2488	.2009
.2232	.0189	.0248	.0456	.0761	.1117	.2177	.2079	.1871	.1563	.1193	.2232
.2455	-.0614	-.0552	-.0347	-.0118	.0203	.0953	.0859	.0686	.0417	.0050	.2455
.2679	-.1417	-.1353	-.1188	-.0921	-.0597	.0036	-.0019	-.0194	-.0463	-.0788	.2679
.2902	-.2220	-.2192	-.2029	-.1800	-.1550	-.1035	-.1086	-.1226	-.1418	-.1740	.2902
.3125	-.2794	-.2726	-.2602	-.2374	-.2159	-.1570	-.1620	-.1761	-.1953	-.2235	.3125
.3348	-.2794	-.2764	-.2679	-.2450	-.2235	-.1455	-.1506	-.1647	-.1877	-.2159	.3348
.3571	-.2679	-.2650	-.2564	-.2336	-.2121						.3571
.3795	-.2542	-.2482	-.2402	-.2215	-.1946	-.1143	-.1176	-.1322	-.1567	-.1862	.3795
.4018	-.2322	-.2275	-.2208	-.2047	-.1765	-.0975	-.1008	-.1167	-.1424	-.1706	.4018
.4241	-.2205	-.2172	-.2078	-.1917	-.1636	-.0781	-.0788	-.0972	-.1230	-.1524	.4241
.4464	-.2024	-.2003	-.1923	-.1787	-.1507	-.0729	-.0762	-.0921	-.1165	-.1421	.4464
.4688	-.1843	-.1835	-.1768	-.1632	-.1391	-.0599	-.0633	-.0791	-.1036	-.1304	.4688
.4911	-.1739	-.1706	-.1651	-.1528	-.1288	-.0483	-.0542	-.0687	-.0919	-.1187	.4911
.5134	-.1597	-.1577	-.1522	-.1424	-.1197	-.0340	-.0400	-.0558	-.0828	-.1109	.5134
.5357	-.1506	-.1486	-.1418	-.1334	-.1120	-.0340	-.0361	-.0532	-.0802	-.1032	.5357
.5580	-.1402	-.1396	-.1315	-.1256	-.1068	-.0302	-.0322	-.0480	-.0712	-.0967	.5580
.5804	-.1273	-.1253	-.1185	-.1165	-.0978	-.0224	-.0257	-.0428	-.0660	-.0889	.5804
.6027	-.1208	-.1189	-.1108	-.1088	-.0900	-.0159	-.0206	-.0363	-.0582	-.0811	.6027
.6250	-.1079	-.1072	-.1004	-.0984	-.0823	-.0172	-.0206	-.0350	-.0543	-.0772	.6250
.6473	-.1014	-.1008	-.0927	-.0893	-.0771	-.0107	-.0141	-.0273	-.0478	-.0694	.6473
.6696	-.0949	-.0943	-.0888	-.0802	-.0720	-.0043	-.0089	-.0195	-.0388	-.0591	.6696
.6920	-.0871	-.0865	-.0810	-.0738	-.0642	-.0043	-.0063	-.0091	-.0232	-.0474	.6920
.7143	-.0574	-.0684	-.0720	-.0647	-.0552	-.0043	-.0038	-.0091	-.0193	-.0396	.7143
.7366	.1744	.1489	.0471	.0118	.0029	.1537	.1308	.0544	.0623	.0655	.7366
.7589	.2560	.2497	.2477	.2243	.2199	.3674	.3610	.3407	.2749	.2431	.7589
.7813	.3001	.3067	.3409	.3448	.3554	.4593	.4554	.4651	.4278	.3910	.7813
.8036	.3648	.3726	.4056	.4304	.4549	.5319	.5278	.5285	.5081	.4805	.8036
.8259	.4075	.4153	.4380	.4576	.4833	.5591	.5524	.5376	.5133	.4909	.8259
.8482	.4296	.4347	.4431	.4537	.4729	.5565	.5459	.5247	.4978	.4740	.8482
.8705	.4347	.4360	.4367	.4394	.4536	.5461	.5369	.5156	.4887	.4649	.8705
.8929	.4322	.4334	.4315	.4330	.4432	.5228	.5149	.4923	.4654	.4429	.8929
.9152	.4192	.4192	.4172	.4161	.4265	.5099	.5045	.4819	.4537	.4325	.9152
.9375	.4075	.4114	.4108	.4122	.4213	.4982	.4929	.4728	.4459	.4234	.9375
.9598	.3959	.3985	.3978	.3993	.4084	.4852	.4813	.4625	.4381	.4156	.9598
.9821	.3855	.3907	.3888	.3902	.4006	.4762	.4722	.4534	.4265	.4027	.9821
1.0045	.3765	.3778	.3797	.3811	.3942	.4762	.4722	.4534	.4252	.4027	1.0045
1.0268	.3674	.3713	.3732	.3798	.3903	.4658	.4619	.4430	.4148	.3988	1.0268
1.0491	.3570	.3610	.3655	.3746	.3864	.4658	.4606	.4392	.4135	.3988	1.0491
1.0714	.3454	.3519	.3603	.3721	.3851	.4516	.4528	.4327	.4122	.3962	1.0714
1.0938	.2988	.3183	.3318	.3474	.3645	.3739	.3765	.3601	.3410	.3275	1.0938

TABLE VII.- SURFACE–PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 1.50$ - Continued

(c) $\alpha = 8°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.4904	1.4931	1.5004	1.5014	1.5009	1.4904	1.4931	1.5004	1.5014	1.5009	.0000
.0223	1.3910	1.3940	1.4202	1.4440	1.4705	1.5286	1.5237	1.5195	1.5014	1.4743	.0223
.0446	1.2458	1.2491	1.2865	1.3253	1.3715	1.5019	1.4931	1.4737	1.4325	1.3829	.0446
.0670	1.0585	1.0736	1.1146	1.1722	1.2344	1.4101	1.3978	1.3629	1.3061	1.2344	.0670
.0893	.8215	.8296	.8854	.9539	1.0364	1.2687	1.2567	1.2139	1.1454	1.0593	.0893
.1116	.6571	.6732	.7135	.7816	.8689	1.1005	1.0889	1.0382	.9616	.8727	.1116
.1339	.4774	.4863	.5263	.5902	.6786	.9247	.9096	.8510	.7740	.6824	.1339
.1563	.3054	.3261	.3506	.4218	.5110	.7374	.7228	.6638	.5864	.4882	.1563
.1786	.1449	.1583	.1978	.2648	.3588	.6036	.5855	.5263	.4447	.3550	.1786
.2009	.0340	.0516	.0909	.1576	.2369	.4698	.4558	.4003	.3222	.2369	.2009
.2232	-.0692	-.0590	-.0237	.0312	.1075	.3207	.3033	.2513	.1844	.1113	.2232
.2455	-.1418	-.1315	-.1001	-.0492	.0161	.1907	.1774	.1291	.0695	-.0029	.2455
.2679	-.2106	-.2040	-.1765	-.1257	-.0715	.0952	.0859	.0374	-.0185	-.0829	.2679
.2902	-.2832	-.2726	-.2491	-.2138	-.1628	-.0233	-.0324	-.0696	-.1181	-.1742	.2902
.3125	-.3291	-.3184	-.2988	-.2674	-.2199	-.0807	-.0896	-.1269	-.1717	-.2237	.3125
.3348	-.3329	-.3260	-.3064	-.2712	-.2276	-.0692	-.0781	-.1192	-.1640	-.2161	.3348
.3571	-.3215	-.3184	-.2950	-.2597	-.2161						.3571
.3795	-.3022	-.2990	-.2807	-.2460	-.2008	-.0328	-.0445	-.0828	-.1355	-.1853	.3795
.4018	-.2763	-.2758	-.2626	-.2305	-.1827	-.0173	-.0224	-.0699	-.1211	-.1711	.4018
.4241	-.2620	-.2577	-.2496	-.2175	-.1724	.0022	-.0056	-.0531	-.1055	-.1582	.4241
.4464	-.2465	-.2422	-.2354	-.2071	-.1607	.0035	.0035	-.0453	-.0977	-.1465	.4464
.4688	-.2284	-.2345	-.2225	-.1955	-.1491	.0178	.0048	-.0350	-.0886	-.1388	.4688
.4911	-.2232	-.2202	-.2108	-.1864	-.1414	.0243	.0126	-.0260	-.0795	-.1297	.4911
.5134	-.2064	-.2086	-.1979	-.1773	-.1310	.0372	.0230	-.0169	-.0730	-.1233	.5134
.5357	-.1960	-.1970	-.1889	-.1669	-.1233	.0385	.0243	-.0156	-.0691	-.1168	.5357
.5580	-.1818	-.1828	-.1785	-.1566	-.1168	.0385	.0269	-.0117	-.0600	-.1129	.5580
.5804	-.1662	-.1621	-.1695	-.1540	-.1168	.0437	.0424	-.0104	-.0561	-.1065	.5804
.6027	-.1533	-.1531	-.1617	-.1514	-.1181	.0476	.0398	-.0040	-.0522	-.1039	.6027
.6250	-.1377	-.1401	-.1578	-.1488	-.1155	.0450	.0360	-.0014	-.0522	-.1052	.6250
.6473	-.1248	-.1311	-.1501	-.1462	-.1142	.0528	.0398	-.0001	-.0522	-.1052	.6473
.6696	-.1131	-.1208	-.1475	-.1410	-.1117	.0567	.0437	.0025	-.0522	-.1000	.6696
.6920	-.0782	-.1079	-.1371	-.1319	-.1065	.0567	.0463	.0115	-.0496	-.0961	.6920
.7143	.1018	-.0135	-.1242	-.1229	-.0961	.0541	.0476	.0271	-.0496	-.0936	.7143
.7366	.1743	.1453	-.0932	-.1138	-.0845	.1982	.1047	.0516	-.0002	-.0690	.7366
.7589	.1989	.2164	.2236	.1610	.1842	.4434	.4265	.3089	.2678	.2449	.7589
.7813	.2468	.2939	.3464	.3140	.3121	.5459	.5680	.5442	.4629	.3703	.7813
.8036	.3089	.3520	.4227	.4009	.4090			.5959	.5253	.4258	.8036
.8259	.3555	.3882	.4330	.4190	.4297			.5714	.4993	.4336	.8259
.8482	.3853	.4011	.4162	.4034	.4194		.5952	.5391	.4707	.4220	.8482
.8705	.3983	.4011	.3904	.3762	.3948	.6017	.5810	.5222	.4564	.4090	.8705
.8929	.4009	.3998	.3787	.3659	.3832	.5784	.5550	.5003	.4355	.3832	.8929
.9152	.3905	.3869	.3593	.3425	.3651	.5680	.5459	.4899	.4225	.3729	.9152
.9375	.3814	.3779	.3529	.3425	.3586	.5589	.5407	.4822	.4082	.3586	.9375
.9598	.3672	.3637	.3425	.3321	.3457	.5524	.5316	.4731	.4017	.3535	.9598
.9821	.3555	.3559	.3361	.3296	.3419	.5420	.5277	.4666	.4004	.3509	.9821
1.0045	.3426	.3430	.3296	.3296	.3419	.5433	.5303	.4654	.4017	.3599	1.0045
1.0268	.3309	.3327	.3270	.3321	.3496	.5355	.5187	.4602	.4017	.3612	1.0268
1.0491	.3167	.3197	.3193	.3179	.3444	.5329	.5187	.4641	.4069	.3586	1.0491
1.0714	.3012	.3120	.3076	.3101	.3354	.5200	.5070	.4550	.4082	.3444	1.0714
1.0938	.2533	.2836	.2818	.2881	.3121	.4278	.4213	.3774	.3276	.2811	1.0938

TABLE VII.- SURFACE–PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 1.50 - Concluded

(d) α = 12°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.4499	1.4591	1.4580	1.4693	1.4660	1.4499	1.4591	1.4580	1.4693	1.4660	.0000
.0223	1.3200	1.3332	1.3587	1.3928	1.4355	1.5224	1.5201	1.5039	1.4807	1.4432	.0223
.0446	1.1520	1.1692	1.2098	1.2703	1.3402	1.5224	1.5163	1.4771	1.4234	1.3516	.0446
.0670	.9535	.9747	1.0265	1.1096	1.2068	1.4651	1.4476	1.3893	1.3086	1.2106	.0670
.0893	.7015	.7229	.7897	.8839	1.0085	1.3506	1.3332	1.2633	1.1632	1.0390	.0893
.1116	.5297	.5589	.6178	.7194	.8483	1.2017	1.1844	1.1028	.9872	.8521	.1116
.1339	.3617	.3835	.4345	.5281	.6577	1.0337	1.0090	.9233	.8036	.6691	.1339
.1563	.2051	.2233	.2664	.3598	.4937	.8580	.8297	.7477	.6238	.4823	.1563
.1786	.0447	.0707	.1213	.2144	.3374	.7168	.6924	.6025	.4860	.3450	.1786
.2009	-.0507	-.0323	.0220	.1035	.2230	.5793	.5589	.4688	.3598	.2306	.2009
.2232	-.1538	-.1276	-.0811	-.0075	.0972	.4304	.4102	.3237	.2182	.1048	.2232
.2455	-.2149	-.1925	-.1575	-.0878	.0018	.2967	.2729	.1977	.0996	-.0058	.2455
.2679	-.2760	-.2573	-.2224	-.1643	-.0782	.1975	.1737	.1022	.0116	-.0859	.2679
.2902	-.3371	-.3222	-.2912	-.2409	-.1659	.0676	.0516	-.0124	-.0878	-.1774	.2902
.3125	-.3753	-.3603	-.3370	-.2906	-.2231	-.0011	-.0132	-.0697	-.1452	-.2231	.3125
.3348	-.3791	-.3641	-.3447	-.2944	-.2269	.0180	-.0018	-.0620	-.1337	-.2155	.3348
.3571	-.3562	-.3450	-.3332	-.2868	-.2193						.3571
.3795	-.3349	-.3310	-.3195	-.2748	-.2055	.0603	.0334	-.0267	-.1071	-.1898	.3795
.4018	-.3207	-.3206	-.3040	-.2618	-.1913	.0758	.0516	-.0112	-.0915	-.1794	.4018
.4241	-.3104	-.3077	-.2924	-.2514	-.1809	.0939	.0684	.0031	-.0772	-.1665	.4241
.4464	-.2961	-.2935	-.2807	-.2424	-.1745	.0952	.0723	.0121	-.0720	-.1626	.4464
.4688	-.2767	-.2767	-.2691	-.2346	-.1655	.1069	.0892	.0238	-.0643	-.1574	.4688
.4911	-.2625	-.2637	-.2601	-.2255	-.1564	.1146	.0957	.0251	-.0617	-.1484	.4911
.5134	-.2431	-.2521	-.2497	-.2178	-.1513	.1263	.1022	.0277	-.0565	-.1484	.5134
.5357	-.2276	-.2404	-.2407	-.2152	-.1513	.1263	.1009	.0277	-.0565	-.1445	.5357
.5580	-.2082	-.2275	-.2329	-.2126	-.1513	.1250	.1009	.0277	-.0552	-.1419	.5580
.5804	-.1914	-.2133	-.2251	-.2074	-.1474	.1263	.1022	.0277	-.0565	-.1406	.5804
.6027	-.1733	-.1978	-.2174	-.2113	-.1500	.1263	.1035	.0302	-.0552	-.1393	.6027
.6250	-.1526	-.1797	-.2161	-.2087	-.1500	.1211	.0983	.0290	-.0552	-.1367	.6250
.6473	-.1345	-.1615	-.2109	-.2100	-.1500	.1211	.0970	.0315	-.0552	-.1354	.6473
.6696	-.1060	-.1447	-.2058	-.2061	-.1500	.1237	.0983	.0315	-.0487	-.1341	.6696
.6920	.0233	-.1189	-.1967	-.2009	-.1487	.1198	.1048	.0290	-.0487	-.1367	.6920
.7143	.1228	-.0063	-.1877	-.1983	-.1500	.1146	.1139	.0406	-.0539	-.1419	.7143
.7366	.1565	.1592	-.0765	-.1957	-.1500	.3010	.1450	.0962	-.0124	-.1315	.7366
.7589	.1862	.2459	.1639	.0595	.1028	.5328	.4915	.3771	.2924	.1648	.7589
.7813	.2392	.3299	.2260	.1528	.2305			.6035	.4066	.2644	.7813
.8036	.2987	.3610	.2867	.2305	.3066				.4662	.3201	.8036
.8259	.3440	.3765	.3165	.2486	.3001			.5815	.4481	.3110	.8259
.8482	.3685	.3830	.3320	.2564	.2859			.5518	.4182	.2916	.8482
.8705	.3776	.3752	.3307	.2512	.2640			.5375	.4027	.2851	.8705
.8929	.3776	.3713	.3255	.2629	.2640			.5129	.3897	.2722	.8929
.9152	.3685	.3532	.3087	.2499	.2575			.5065	.3858	.2722	.9152
.9375	.3582	.3429	.2984	.2460	.2563		.6044	.5052	.3858	.2618	.9375
.9598	.3427	.3248	.2790	.2357	.2472		.5979	.5013	.3806	.2541	.9598
.9821	.3297	.3118	.2686	.2318	.2434		.5953	.5000	.3715	.2541	.9821
1.0045	.3142	.3002	.2609	.2305	.2472		.5953	.5000	.3728	.2554	1.0045
1.0268	.3000	.2885	.2557	.2331	.2498		.5888	.4896	.3663	.2567	1.0268
1.0491	.2858	.2756	.2493	.2279	.2485		.5823	.4858	.3650	.2567	1.0491
1.0714	.2677	.2627	.2441	.2253	.2485	.5910	.5642	.4728	.3573	.2567	1.0714
1.0938	.2211	.2290	.2221	.2098	.2318	.4900	.4591	.3835	.2859	.2049	1.0938

TABLE VIII.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 1.90$

(a) $\alpha = 0°$

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.6236	1.6257	1.6260	1.6243	1.6293	1.6236	1.6257	1.6260	1.6243	1.6293	.0000
.0223	1.5854	1.5875	1.5878	1.5900	1.5949	1.5969	1.5990	1.5993	1.5977	1.5987	.0223
.0446	1.4862	1.4884	1.4887	1.4871	1.4920	1.5014	1.5074	1.5039	1.5024	1.4996	.0446
.0670	1.3335	1.3358	1.3361	1.3385	1.3432	1.3411	1.3434	1.3437	1.3423	1.3394	.0670
.0893	1.1235	1.1260	1.1263	1.1250	1.1335	1.1502	1.1527	1.1492	1.1479	1.1411	.0893
.1116	.9441	.9468	.9508	.9497	.9543	.9517	.9544	.9508	.9497	.9428	.1116
.1339	.7533	.7561	.7601	.7591	.7636	.7685	.7675	.7639	.7630	.7598	.1339
.1563	.5815	.5883	.5846	.5876	.5920	.5624	.5654	.5655	.5609	.5615	.1563
.1786	.4173	.4205	.4206	.4237	.4280	.4212	.4243	.4206	.4199	.4166	.1786
.2009	.3028	.3060	.3023	.3056	.3136	.3105	.3137	.3100	.3132	.3098	.2009
.2232	.1807	.1840	.1841	.1874	.1916	.1921	.1954	.1917	.1912	.1916	.2232
.2455	.1005	.1039	.1040	.1036	.1077	.0891	.0925	.0925	.0921	.0886	.2455
.2679	.0242	.0276	.0277	.0273	.0314	.0165	.0200	.0162	.0197	.0161	.2679
.2902	-.0560	-.0487	-.0524	-.0489	-.0487	-.0636	-.0601	-.0600	-.0603	-.0639	.2902
.3125	-.1056	-.1021	-.1058	-.1061	-.1021	-.1056	-.1021	-.1058	-.1061	-.1059	.3125
.3348	-.1133	-.1097	-.1096	-.1099	-.1097	-.1056	-.1021	-.1020	-.1022	-.1059	.3348
.3571	-.1133	-.1097	-.1096	-.1099	-.1097						.3571
.3795	-.1086	-.1086	-.1077	-.1066	-.1053	-.0963	-.0930	-.0938	-.0956	-.0946	.3795
.4018	-.0970	-.0969	-.0961	-.0963	-.0924	-.0860	-.0866	-.0886	-.0878	-.0882	.4018
.4241	-.0879	-.0930	-.0896	-.0898	-.0872	-.0744	-.0762	-.0757	-.0762	-.0791	.4241
.4464	-.0853	-.0853	-.0845	-.0834	-.0821	-.0744	-.0749	-.0757	-.0762	-.0778	.4464
.4688	-.0737	-.0736	-.0767	-.0756	-.0730	-.0680	-.0685	-.0692	-.0671	-.0714	.4688
.4911	-.0737	-.0736	-.0729	-.0717	-.0705	-.0628	-.0620	-.0640	-.0633	-.0649	.4911
.5134	-.0672	-.0672	-.0677	-.0666	-.0653	-.0550	-.0542	-.0562	-.0555	-.0585	.5134
.5357	-.0659	-.0659	-.0651	-.0627	-.0614	-.0538	-.0542	-.0549	-.0542	-.0533	.5357
.5580	-.0620	-.0620	-.0612	-.0601	-.0575	-.0512	-.0516	-.0523	-.0464	-.0520	.5580
.5804	-.0556	-.0555	-.0535	-.0524	-.0524	-.0486	-.0478	-.0472	-.0464	-.0468	.5804
.6027	-.0530	-.0529	-.0509	-.0524	-.0511	-.0447	-.0426	-.0407	-.0400	-.0430	.6027
.6250	-.0452	-.0465	-.0457	-.0472	-.0459	-.0421	-.0413	-.0381	-.0400	-.0430	.6250
.6473	-.0401	-.0400	-.0406	-.0408	-.0408	-.0357	-.0348	-.0329	-.0348	-.0365	.6473
.6696	-.0336	-.0348	-.0354	-.0369	-.0369	-.0279	-.0284	-.0277	-.0296	-.0300	.6696
.6920	-.0271	-.0284	-.0277	-.0291	-.0291	-.0215	-.0232	-.0238	-.0219	-.0262	.6920
.7143	-.0232	-.0232	-.0225	-.0227	-.0227	-.0189	-.0193	-.0212	-.0219	-.0236	.7143
.7366	-.0207	-.0206	-.0186	-.0188	-.0188	-.0086	-.0090	-.0109	-.0089	-.0132	.7366
.7589	.0608	.0609	.0627	.0664	.0638	.1346	.1372	.1330	.1360	.1341	.7589
.7813	.2678	.2666	.2694	.2716	.2716	.2972	.3028	.3066	.3029	.2995	.7813
.8036	.3104	.3118	.3133	.3155	.3168	.3295	.3351	.3338	.3352	.3331	.8036
.8259	.3234	.3248	.3262	.3258	.3284	.3385	.3390	.3364	.3365	.3357	.8259
.8482	.3247	.3261	.3249	.3258	.3284	.3385	.3390	.3364	.3365	.3344	.8482
.8705	.3260	.3274	.3262	.3258	.3271	.3411	.3390	.3416	.3352	.3344	.8705
.8929	.3324	.3300	.3314	.3297	.3297	.3334	.3351	.3351	.3287	.3279	.8929
.9152	.3247	.3235	.3236	.3194	.3232	.3308	.3325	.3312	.3274	.3253	.9152
.9375	.3273	.3261	.3236	.3194	.3232	.3308	.3313	.3286	.3274	.3292	.9375
.9598	.3247	.3235	.3172	.3168	.3194	.3282	.3287	.3247	.3274	.3318	.9598
.9821	.3221	.3196	.3133	.3168	.3194	.3218	.3222	.3183	.3249	.3253	.9821
1.0045	.3208	.3183	.3133	.3155	.3181	.3218	.3222	.3235	.3236	.3266	1.0045
1.0268	.3195	.3183	.3159	.3168	.3207	.3166	.3157	.3235	.3236	.3227	1.0268
1.0491	.3169	.3131	.3133	.3168	.3181	.3140	.3144	.3235	.3223	.3227	1.0491
1.0714	.3169	.3131	.3146	.3168	.3181	.3127	.3144	.3235	.3223	.3189	1.0714
1.0938	.3130	.3106	.3133	.3129	.3155	.2895	.2912	.2975	.2977	.2943	1.0938

TABLE VIII.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 1.90 - Continued

(b) α = 4°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.6189	1.6223	1.6180	1.6209	1.6216	1.6189	1.6223	1.6180	1.6209	1.6216	.0000
.0223	1.5426	1.5498	1.5570	1.5713	1.5873	1.6189	1.6223	1.6180	1.6056	1.5949	.0223
.0446	1.4091	1.4201	1.4311	1.4569	1.4843	1.5617	1.5612	1.5455	1.5218	1.4996	.0446
.0670	1.2374	1.2446	1.2633	1.2968	1.3356	1.4281	1.4277	1.4082	1.3731	1.3356	.0670
.0893	1.0046	1.0119	1.0345	1.0757	1.1220	1.2564	1.2560	1.2328	1.1901	1.1487	.0893
.1116	.8291	.8402	.8667	.9004	.9504	1.0657	1.0653	1.0383	.9957	.9428	.1116
.1339	.6459	.6533	.6760	.7136	.7598	.8825	.8784	.8514	.8089	.7598	.1339
.1563	.4742	.4855	.5044	.5382	.5843	.6841	.6800	.6493	.6069	.5615	.1563
.1786	.3140	.3253	.3442	.3781	.4204	.5391	.5351	.5082	.4658	.4165	.1786
.2009	.2033	.2146	.2298	.2638	.3060	.4170	.4206	.3899	.3514	.3098	.2009
.2232	.0965	.1040	.1230	.1494	.1877	.2873	.2871	.2641	.2295	.1915	.2232
.2455	.0240	.0353	.0467	.0732	.1038	.1728	.1727	.1535	.1227	.0924	.2455
.2679	-.0409	-.0333	-.0220	.0007	.0314	.0927	.0887	.0734	.0465	.0161	.2679
.2902	-.1096	-.1020	-.0906	-.0717	-.0487	.0011	.0010	-.0143	-.0374	-.0601	.2902
.3125	-.1553	-.1440	-.1364	-.1213	-.1021	-.0485	-.0486	-.0601	-.0793	-.1059	.3125
.3348	-.1630	-.1554	-.1478	-.1289	-.1097	-.0485	-.0486	-.0601	-.0793	-.1021	.3348
.3571	-.1592	-.1516	-.1478	-.1289	-.1097						.3571
.3795	-.1553	-.1515	-.1427	-.1271	-.1041	-.0321	-.0387	-.0538	-.0750	-.0989	.3795
.4018	-.1449	-.1425	-.1337	-.1180	-.0950	-.0256	-.0323	-.0460	-.0699	-.0898	.4018
.4241	-.1372	-.1360	-.1260	-.1103	-.0873	-.0165	-.0232	-.0370	-.0595	-.0833	.4241
.4464	-.1320	-.1296	-.1221	-.1064	-.0860	-.0165	-.0219	-.0344	-.0556	-.0807	.4464
.4688	-.1217	-.1218	-.1143	-.1012	-.0796	-.0101	-.0154	-.0266	-.0505	-.0755	.4688
.4911	-.1139	-.1166	-.1092	-.0961	-.0744	-.0062	-.0128	-.0240	-.0453	-.0691	.4911
.5134	-.1023	-.1076	-.1027	-.0922	-.0705	.0003	-.0064	-.0214	-.0414	-.0652	.5134
.5357	-.0932	-.0998	-.0976	-.0883	-.0666	.0003	-.0064	-.0201	-.0388	-.0600	.5357
.5580	-.0855	-.0895	-.0911	-.0831	-.0654	.0016	-.0038	-.0176	-.0337	-.0574	.5580
.5804	-.0764	-.0792	-.0834	-.0793	-.0615	.0029	-.0025	-.0150	-.0324	-.0548	.5804
.6027	-.0713	-.0714	-.0730	-.0702	-.0576	.0068	.0001	-.0111	-.0298	-.0496	.6027
.6250	-.0648	-.0637	-.0640	-.0560	-.0473	.0029	.0001	-.0111	-.0259	-.0405	.6250
.6473	-.0596	-.0572	-.0563	-.0444	-.0305	.0093	.0040	-.0059	-.0156	-.0250	.6473
.6696	-.0609	-.0533	-.0524	-.0379	-.0215	.0106	.0066	.0019	-.0000	-.0133	.6696
.6920	-.0596	-.0533	-.0485	-.0328	-.0150	.0106	.0066	.0122	.0051	-.0081	.6920
.7143	-.0583	-.0546	-.0485	-.0276	-.0099	.0093	.0066	.0122	.0051	-.0055	.7143
.7366	-.0377	-.0352	-.0382	-.0250	-.0112	.0171	.0182	.0109	-.0013	-.0042	.7366
.7589	.0813	.0462	.0238	-.0082	-.0034	.1698	.1553	.0886	.0271	.0061	.7589
.7813	.1808	.1586	.1322	.0667	.0740	.3678	.3623	.3153	.2276	.1371	.7813
.8036	.2118	.2115	.2329	.2281	.2663	.4118	.4011	.3710	.3375	.2952	.8036
.8259	.2338	.2426	.2755	.2966	.3283	.4183	.4088	.3839	.3620	.3328	.8259
.8482	.2480	.2581	.2871	.3095	.3334	.4157	.4075	.3826	.3620	.3328	.8482
.8705	.2623	.2658	.2871	.3056	.3270	.4196	.4062	.3826	.3620	.3315	.8705
.8929	.2700	.2749	.2910	.3056	.3270	.4053	.3985	.3749	.3478	.3211	.8929
.9152	.2674	.2710	.2781	.2940	.3166	.4028	.3946	.3710	.3426	.3211	.9152
.9375	.2713	.2749	.2742	.2927	.3153	.4015	.3933	.3697	.3439	.3224	.9375
.9598	.2700	.2710	.2716	.2876	.3102	.4002	.3907	.3671	.3439	.3185	.9598
.9821	.2674	.2684	.2703	.2863	.3089	.3911	.3830	.3619	.3413	.3134	.9821
1.0045	.2674	.2671	.2690	.2850	.3076	.3911	.3817	.3645	.3413	.3134	1.0045
1.0268	.2648	.2658	.2703	.2850	.3089	.3859	.3791	.3658	.3401	.3069	1.0268
1.0491	.2610	.2619	.2677	.2798	.3050	.3859	.3765	.3671	.3362	.3056	1.0491
1.0714	.2597	.2619	.2677	.2798	.3050	.3833	.3765	.3645	.3362	.3043	1.0714
1.0938	.2532	.2606	.2677	.2798	.3024	.3575	.3519	.3412	.3142	.2848	1.0938

TABLE VIII.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 1.90 - Continued

(c) α = 8°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.5876	1.5969	1.5998	1.5987	1.5988	1.5876	1.5969	1.5998	1.5987	1.5988	.0000
.0223	1.4770	1.4900	1.5082	1.5339	1.5683	1.6295	1.6312	1.6189	1.5987	1.5721	.0223
.0446	1.3168	1.3335	1.3594	1.4080	1.4615	1.5990	1.6007	1.5731	1.5301	1.4768	.0446
.0670	1.1261	1.1464	1.1839	1.2440	1.3128	1.5037	1.4976	1.4548	1.3928	1.3204	.0670
.0893	.8782	.8945	.9397	1.0114	1.1031	1.3549	1.3449	1.2984	1.2250	1.1374	.0893
.1116	.7027	.7227	.7604	.8436	.9314	1.1795	1.1732	1.1152	1.0305	.9353	.1116
.1339	.5273	.5433	.5810	.6492	.7369	.9926	.9861	.9244	.8436	.7484	.1339
.1563	.3747	.3830	.4170	.4814	.5691	.8019	.7914	.7298	.6453	.5501	.1563
.1786	.2145	.2265	.2644	.3288	.4090	.6569	.6464	.5887	.5042	.4128	.1786
.2009	.1154	.1311	.1613	.2259	.2984	.5311	.5204	.4628	.3860	.3022	.2009
.2232	.0200	.0356	.0621	.1153	.1840	.3861	.3754	.3292	.2602	.1878	.2232
.2455	-.0410	-.0331	-.0027	.0428	.1001	.2641	.2570	.2148	.1534	.0924	.2455
.2679	-.1020	-.0903	-.0676	-.0258	.0238	.1726	.1616	.1232	.0733	.0162	.2679
.2902	-.1593	-.1476	-.1286	-.0945	-.0525	.0696	.0623	.0316	-.0144	-.0601	.2902
.3125	-.1936	-.1858	-.1706	-.1402	-.1059	.0162	.0089	-.0218	-.0601	-.1059	.3125
.3348	-.2050	-.1934	-.1821	-.1479	-.1097	.0162	.0089	-.0180	-.0601	-.1021	.3348
.3571	-.2012	-.1934	-.1782	-.1479	-.1097						.3571
.3795	-.1942	-.1894	-.1738	-.1453	-.1064	.0329	.0202	-.0125	-.0529	-.1018	.3795
.4018	-.1838	-.1790	-.1647	-.1375	-.0999	.0368	.0266	-.0073	-.0464	-.0902	.4018
.4241	-.1735	-.1687	-.1583	-.1298	-.0921	.0446	.0344	-.0008	-.0386	-.0837	.4241
.4464	-.1644	-.1610	-.1518	-.1285	-.0908	.0446	.0344	.0031	-.0347	-.0811	.4464
.4688	-.1567	-.1545	-.1467	-.1233	-.0883	.0498	.0396	.0069	-.0283	-.0811	.4688
.4911	-.1489	-.1494	-.1415	-.1195	-.0844	.0537	.0435	.0121	-.0283	-.0746	.4911
.5134	-.1425	-.1442	-.1351	-.1156	-.0818	.0575	.0487	.0160	-.0270	-.0707	.5134
.5357	-.1360	-.1391	-.1312	-.1130	-.0792	.0562	.0487	.0160	-.0257	-.0694	.5357
.5580	-.1295	-.1326	-.1260	-.1104	-.0779	.0562	.0487	.0160	-.0244	-.0682	.5580
.5804	-.1218	-.1249	-.1209	-.1065	-.0753	.0588	.0500	.0160	-.0244	-.0682	.5804
.6027	-.1115	-.1184	-.1170	-.1040	-.0753	.0627	.0526	.0186	-.0244	-.0669	.6027
.6250	-.1063	-.1107	-.1093	-.1014	-.0741	.0614	.0500	.0186	-.0244	-.0656	.6250
.6473	-.0998	-.1029	-.1002	-.0988	-.0728	.0627	.0526	.0186	-.0218	-.0643	.6473
.6696	-.0921	-.0978	-.0912	-.0936	-.0663	.0653	.0538	.0238	-.0179	-.0591	.6696
.6920	-.0843	-.0926	-.0822	-.0794	-.0495	.0640	.0551	.0484	.0015	-.0436	.6920
.7143	-.0740	-.0862	-.0770	-.0665	-.0366	.0588	.0564	.0639	.0157	-.0358	.7143
.7366	-.0313	-.0565	-.0718	-.0627	-.0263	.0666	.0759	.0678	.0170	-.0358	.7366
.7589	.0643	.0183	-.0357	-.0407	-.0237	.2298	.1575	.0717	.0261	.0121	.7589
.7813	.1457	.1202	.0533	.0445	.0564	.4486	.4257	.2517	.2085	.1494	.7813
.8036	.1909	.2156	.1953	.2059	.2528	.4940	.4840	.4692	.3728	.2555	.8036
.8259	.2219	.2518	.2495	.2549	.2877	.5030	.4892	.4601	.3702	.2814	.8259
.8482	.2413	.2556	.2495	.2511	.2915	.4991	.4866	.4433	.3586	.2879	.8482
.8705	.2503	.2505	.2366	.2343	.2760	.5004	.4853	.4342	.3560	.2931	.8705
.8929	.2555	.2492	.2392	.2369	.2786	.4875	.4736	.4200	.3521	.2827	.8929
.9152	.2491	.2389	.2288	.2265	.2657	.4823	.4658	.4109	.3495	.2775	.9152
.9375	.2465	.2389	.2314	.2291	.2670	.4784	.4607	.4096	.3457	.2737	.9375
.9598	.2413	.2350	.2288	.2278	.2657	.4745	.4594	.4096	.3444	.2724	.9598
.9821	.2361	.2324	.2275	.2265	.2631	.4694	.4503	.4044	.3366	.2672	.9821
1.0045	.2310	.2285	.2250	.2239	.2605	.4694	.4503	.4057	.3366	.2672	1.0045
1.0268	.2271	.2273	.2237	.2227	.2605	.4681	.4503	.4031	.3340	.2633	1.0268
1.0491	.2219	.2208	.2185	.2201	.2567	.4681	.4555	.4044	.3327	.2620	1.0491
1.0714	.2180	.2195	.2185	.2214	.2554	.4681	.4568	.4044	.3314	.2607	1.0714
1.0938	.2129	.2182	.2185	.2214	.2567	.4370	.4296	.3772	.3107	.2426	1.0938

TABLE VIII.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 1.90 - Concluded

(d) α = 12°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.5428	1.5493	1.5575	1.5611	1.5602	1.5428	1.5493	1.5575	1.5611	1.5602	.0000
.0223	1.4016	1.4197	1.4468	1.4848	1.5259	1.6191	1.6218	1.6071	1.5725	1.5335	.0223
.0446	1.2261	1.2442	1.2828	1.3513	1.4268	1.6229	1.6180	1.5803	1.5153	1.4420	.0446
.0670	1.0200	1.0421	1.0959	1.1796	1.2857	1.5619	1.5493	1.4888	1.3970	1.2895	.0670
.0893	.7567	.7789	.8441	.9469	1.0722	1.4398	1.4273	1.3553	1.2407	1.1103	.0893
.1116	.5773	.6035	.6686	.7715	.9082	1.2833	1.2671	1.1836	1.0576	.9197	.1116
.1339	.4094	.4281	.4893	.5884	.7138	1.1040	1.0840	1.0005	.8745	.7329	.1339
.1563	.2759	.2908	.3405	.4282	.5498	.9208	.8972	.8098	.6799	.5384	.1563
.1786	.1309	.1497	.1918	.2794	.3973	.7796	.7522	.6648	.5388	.4088	.1786
.2009	.0431	.0581	.1002	.1841	.2868	.6460	.6188	.5351	.4206	.2982	.2009
.2232	-.0408	-.0296	.0125	.0811	.1724	.4896	.4700	.3939	.2947	.1838	.2232
.2455	-.1019	-.0868	-.0524	.0124	.0923	.3598	.3403	.2757	.1841	.0885	.2455
.2679	-.1515	-.1364	-.1096	-.0524	.0199	.2644	.2450	.1841	.1001	.0161	.2679
.2902	-.2049	-.1898	-.1630	-.1173	-.0564	.1500	.1344	.0849	.0124	-.0602	.2902
.3125	-.2278	-.2203	-.2012	-.1592	-.1060	.0851	.0734	.0277	-.0372	-.1060	.3125
.3348	-.2355	-.2279	-.2088	-.1707	-.1136	.0851	.0734	.0277	-.0372	-.1021	.3348
.3571	-.2240	-.2203	-.2050	-.1669	-.1136						.3571
.3795	-.2108	-.2098	-.2019	-.1635	-.1106	.1011	.0873	.0342	-.0286	-.0983	.3795
.4018	-.2044	-.2033	-.1941	-.1571	-.1042	.1102	.0963	.0420	-.0247	-.0932	.4018
.4241	-.1992	-.1968	-.1864	-.1519	-.1003	.1180	.1028	.0498	-.0195	-.0893	.4241
.4464	-.1979	-.1956	-.1825	-.1481	-.0964	.1180	.1053	.0524	-.0195	-.0880	.4464
.4688	-.1940	-.1917	-.1773	-.1455	-.0938	.1245	.1066	.0550	-.0156	-.0841	.4688
.4911	-.1889	-.1852	-.1735	-.1455	-.0938	.1284	.1092	.0550	-.0156	-.0828	.4911
.5134	-.1824	-.1775	-.1670	-.1429	-.0913	.1310	.1105	.0550	-.0143	-.0815	.5134
.5357	-.1720	-.1684	-.1657	-.1416	-.0913	.1284	.1105	.0537	-.0169	-.0828	.5357
.5580	-.1604	-.1594	-.1631	-.1416	-.0926	.1271	.1105	.0524	-.0169	-.0841	.5580
.5804	-.1475	-.1504	-.1593	-.1416	-.0926	.1284	.1092	.0524	-.0182	-.0841	.5804
.6027	-.1384	-.1413	-.1541	-.1416	-.0938	.1297	.1066	.0524	-.0182	-.0867	.6027
.6250	-.1281	-.1362	-.1541	-.1416	-.0951	.1245	.1053	.0511	-.0182	-.0867	.6250
.6473	-.1190	-.1310	-.1502	-.1429	-.0964	.1258	.1053	.0511	-.0221	-.0893	.6473
.6696	-.1100	-.1284	-.1450	-.1455	-.0990	.1245	.1066	.0524	-.0221	-.0919	.6696
.6920	-.0984	-.1245	-.1373	-.1468	-.1003	.1232	.1144	.0588	-.0221	-.0906	.6920
.7143	-.0738	-.1142	-.1347	-.1468	-.0990	.1180	.1350	.0847	-.0169	-.0893	.7143
.7366	-.0066	-.0793	-.1295	-.1416	-.0861	.1284	.1363	.0912	-.0118	-.0764	.7366
.7589	.0658	-.0057	-.1063	-.1094	-.0590	.3334	.1544	.1029	.0671	.0180	.7589
.7813	.1214	.0963	.0527	.0377	.0932	.5422	.5238	.4072	.3089	.1551	.7813
.8036	.1732	.1880	.1612	.1499	.2209	.5954	.5974	.5018	.3515	.2353	.8036
.8259	.2081	.2280	.1547	.1473	.2261	.5993	.5896	.4966	.3554	.2391	.8259
.8482	.2262	.2358	.1522	.1396	.2235	.5915	.5715	.4849	.3515	.2288	.8482
.8705	.2352	.2358	.1534	.1280	.2093	.5889	.5651	.4784	.3489	.2236	.8705
.8929	.2404	.2358	.1625	.1293	.2119	.5798	.5496	.4629	.3373	.2159	.8929
.9152	.2339	.2229	.1612	.1190	.2003	.5759	.5496	.4577	.3321	.2107	.9152
.9375	.2301	.2177	.1651	.1202	.1977	.5721	.5496	.4551	.3295	.2042	.9375
.9598	.2223	.2099	.1651	.1177	.1926	.5695	.5483	.4538	.3257	.2029	.9598
.9821	.2158	.2035	.1638	.1164	.1913	.5643	.5431	.4538	.3257	.2003	.9821
1.0045	.2094	.1970	.1612	.1177	.1900	.5708	.5457	.4551	.3270	.2016	1.0045
1.0268	.2042	.1919	.1599	.1202	.1913	.5669	.5418	.4512	.3270	.2016	1.0268
1.0491	.1964	.1841	.1573	.1202	.1900	.5682	.5418	.4500	.3283	.2016	1.0491
1.0714	.1926	.1802	.1573	.1228	.1913	.5695	.5393	.4500	.3270	.2003	1.0714
1.0938	.1861	.1764	.1573	.1267	.1913	.5266	.5031	.4189	.3037	.1835	1.0938

TABLE IX.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 2.30$

(a) $\alpha = 0°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6809	1.6861	1.6812	1.6817	1.6843	1.6809	1.6861	1.6812	1.6817	1.6843	.0000
.0223	1.6481	1.6509	1.6484	1.6441	1.6467	1.6504	1.6298	1.6461	1.6465	1.6467	.0223
.0446	1.5377	1.5452	1.5429	1.5406	1.5432	1.5471	1.5499	1.5429	1.5430	1.5456	.0446
.0670	1.3828	1.3855	1.3834	1.3854	1.3833	1.3757	1.3762	1.3717	1.3713	1.3668	.0670
.0893	1.1621	1.1648	1.1653	1.1667	1.1669	1.1762	1.1789	1.1723	1.1715	1.1669	.0893
.1116	.9813	.9840	.9870	.9880	.9858	.9719	.9699	.9636	.9598	.9576	.1116
.1339	.8029	.8032	.8064	.8046	.8047	.7888	.7914	.7830	.7811	.7765	.1339
.1563	.6080	.6082	.6094	.6047	.6095	.5845	.5848	.5766	.5742	.5719	.1563
.1786	.4507	.4509	.4523	.4542	.4520	.4390	.4392	.4335	.4331	.4308	.1786
.2009	.3357	.3382	.3374	.3367	.3367	.3333	.3311	.3233	.3225	.3203	.2009
.2232	.2206	.2231	.2225	.2214	.2215	.2183	.2208	.2154	.2120	.2121	.2232
.2455	.1432	.1433	.1427	.1415	.1392	.1244	.1268	.1240	.1203	.1204	.2455
.2679	.0704	.0705	.0700	.0709	.0710	.0586	.0587	.0559	.0545	.0545	.2679
.2902	-.0001	.0000	-.0027	.0004	-.0019	-.0095	-.0117	-.0121	-.0137	-.0161	.2902
.3125	-.0494	-.0493	-.0496	-.0490	-.0513	-.0517	-.0517	-.0543	-.0537	-.0560	.3125
.3348	-.0564	-.0540	-.0566	-.0561	-.0584	-.0541	-.0540	-.0566	-.0561	-.0584	.3348
.3571	-.0541	-.0540	-.0543	-.0537	-.0560						.3571
.3795	-.0538	-.0535	-.0529	-.0523	-.0511	-.0486	-.0476	-.0499	-.0497	-.0509	.3795
.4018	-.0479	-.0488	-.0482	-.0464	-.0440	-.0451	-.0453	-.0475	-.0461	-.0473	.4018
.4241	-.0467	-.0476	-.0459	-.0440	-.0429	-.0404	-.0406	-.0440	-.0426	-.0438	.4241
.4464	-.0432	-.0441	-.0424	-.0405	-.0393	-.0404	-.0406	-.0428	-.0402	-.0414	.4464
.4688	-.0397	-.0406	-.0388	-.0370	-.0358	-.0368	-.0370	-.0393	-.0367	-.0379	.4688
.4911	-.0385	-.0394	-.0365	-.0358	-.0334	-.0345	-.0347	-.0357	-.0343	-.0355	.4911
.5134	-.0362	-.0370	-.0330	-.0322	-.0311	-.0309	-.0300	-.0310	-.0296	-.0308	.5134
.5357	-.0362	-.0359	-.0330	-.0322	-.0299	-.0297	-.0300	-.0310	-.0296	-.0308	.5357
.5580	-.0338	-.0335	-.0318	-.0299	-.0276	-.0297	-.0288	-.0298	-.0284	-.0296	.5580
.5804	-.0291	-.0276	-.0259	-.0252	-.0240	-.0286	-.0276	-.0275	-.0261	-.0273	.5804
.6027	-.0291	-.0276	-.0259	-.0252	-.0240	-.0262	-.0241	-.0239	-.0237	-.0249	.6027
.6250	-.0256	-.0241	-.0224	-.0228	-.0205	-.0262	-.0229	-.0239	-.0237	-.0249	.6250
.6473	-.0221	-.0206	-.0201	-.0205	-.0193	-.0215	-.0182	-.0192	-.0190	-.0214	.6473
.6696	-.0174	-.0159	-.0165	-.0193	-.0193	-.0156	-.0123	-.0133	-.0143	-.0179	.6696
.6920	-.0115	-.0100	-.0119	-.0146	-.0158	-.0097	-.0065	-.0063	-.0084	-.0120	.6920
.7143	-.0044	-.0041	-.0060	-.0087	-.0099	-.0062	-.0029	-.0039	-.0061	-.0084	.7143
.7366	-.0021	-.0017	-.0013	-.0040	-.0052	.0021	.0030	.0020	.0022	-.0002	.7366
.7589	.0214	.0218	.0198	.0172	.0172	.0598	.0606	.0597	.0588	.0564	.7589
.7813	.2130	.2171	.2217	.2267	.2279	.2341	.2336	.2386	.2414	.2414	.7813
.8036	.2436	.2489	.2557	.2574	.2644	.2553	.2560	.2563	.2627	.2614	.8036
.8259	.2553	.2583	.2663	.2680	.2738	.2600	.2607	.2634	.2662	.2650	.8259
.8482	.2577	.2619	.2663	.2691	.2726	.2647	.2619	.2657	.2685	.2685	.8482
.8705	.2624	.2642	.2686	.2738	.2750	.2695	.2701	.2704	.2744	.2720	.8705
.8929	.2683	.2701	.2745	.2762	.2797	.2695	.2677	.2693	.2733	.2709	.8929
.9152	.2683	.2689	.2733	.2727	.2738	.2695	.2689	.2693	.2721	.2709	.9152
.9375	.2694	.2724	.2780	.2727	.2738	.2695	.2677	.2693	.2709	.2709	.9375
.9598	.2706	.2724	.2745	.2715	.2714	.2706	.2689	.2704	.2697	.2709	.9598
.9821	.2694	.2724	.2722	.2680	.2703	.2671	.2654	.2669	.2662	.2673	.9821
1.0045	.2694	.2724	.2710	.2680	.2703	.2695	.2689	.2693	.2685	.2697	1.0045
1.0268	.2694	.2736	.2698	.2691	.2703	.2695	.2677	.2657	.2662	.2685	1.0268
1.0491	.2683	.2724	.2686	.2680	.2691	.2695	.2701	.2646	.2685	.2685	1.0491
1.0714	.2694	.2724	.2698	.2691	.2703	.2706	.2713	.2669	.2685	.2697	1.0714
1.0938	.2730	.2724	.2733	.2727	.2726	.2577	.2572	.2528	.2544	.2555	1.0938

TABLE IX.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 2.30 - Continued

(b) α = 4°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.6729	1.6747	1.6794	1.6806	1.6789	1.6729	1.6747	1.6794	1.6806	1.6789	.0000
.0223	1.5979	1.6044	1.6135	1.6288	1.6437	1.6775	1.6771	1.6723	1.6618	1.6437	.0223
.0446	1.4361	1.4706	1.4863	1.5135	1.5404	1.6072	1.6067	1.5899	1.5676	1.5427	.0446
.0670	1.2791	1.2947	1.3121	1.3465	1.3854	1.4666	1.4613	1.4393	1.4029	1.3666	.0670
.0893	1.0401	1.0484	1.0720	1.1135	1.1647	1.2862	1.2783	1.2533	1.2147	1.1670	.0893
.1116	.8596	.8724	.9001	.9370	.9862	1.0893	1.0765	1.0531	1.0076	.9580	.1116
.1339	.6838	.6965	.7188	.7582	.8007	.8994	.8889	.8624	.8217	.7749	.1339
.1563	.4963	.5041	.5281	.5582	.6035	.6932	.6894	.6552	.6147	.5706	.1563
.1786	.3487	.3563	.3751	.4076	.4485	.5502	.5393	.5093	.4688	.4297	.1786
.2009	.2409	.2508	.2668	.2970	.3334	.4331	.4220	.3962	.3606	.3217	.2009
.2232	.1401	.1499	.1632	.1888	.2207	.3065	.3000	.2738	.2453	.2113	.2232
.2455	.0721	.0795	.0878	.1135	.1409	.2010	.1968	.1514	.1511	.1221	.2455
.2679	.0112	.0162	.0290	.0476	.0704	.1260	.1194	.1019	.0805	.0540	.2679
.2902	-.0497	-.0425	-.0346	-.0159	.0023	.0440	.0396	.0243	.0076	-.0141	.2902
.3125	-.0919	-.0847	-.0793	-.0630	-.0493	-.0029	-.0073	-.0228	-.0371	-.0540	.3125
.3348	-.0990	-.0941	-.0841	-.0748	-.0564	-.0052	-.0096	-.0252	-.0395	-.0564	.3348
.3571	-.0966	-.0918	-.0864	-.0700	-.0540						.3571
.3795	-.0917	-.0904	-.0816	-.0672	-.0498	-.0005	-.0061	-.0188	-.0328	-.0510	.3795
.4018	-.0870	-.0845	-.0768	-.0613	-.0451	.0019	-.0026	-.0153	-.0304	-.0474	.4018
.4241	-.0847	-.0833	-.0733	-.0601	-.0439	.0066	.0021	-.0118	-.0269	-.0451	.4241
.4464	-.0823	-.0786	-.0698	-.0566	-.0404	.0054	-.0002	-.0106	-.0245	-.0427	.4464
.4688	-.0776	-.0763	-.0674	-.0542	-.0380	.0078	.0033	-.0070	-.0221	-.0392	.4688
.4911	-.0729	-.0716	-.0651	-.0519	-.0357	.0101	.0045	-.0059	-.0198	-.0380	.4911
.5134	-.0647	-.0669	-.0615	-.0483	-.0333	.0137	.0068	-.0023	-.0174	-.0345	.5134
.5357	-.0565	-.0598	-.0580	-.0472	-.0321	.0125	.0068	-.0023	-.0174	-.0333	.5357
.5580	-.0495	-.0504	-.0533	-.0448	-.0310	.0125	.0068	-.0023	-.0162	-.0321	.5580
.5804	-.0436	-.0422	-.0450	-.0413	-.0274	.0125	.0080	-.0011	-.0150	-.0310	.5804
.6027	-.0413	-.0375	-.0356	-.0366	-.0262	.0148	.0104	.0000	-.0139	-.0274	.6027
.6250	-.0377	-.0328	-.0285	-.0259	-.0215	.0125	.0092	.0000	-.0115	-.0204	.6250
.6473	-.0342	-.0293	-.0238	-.0177	-.0098	.0137	.0104	.0048	-.0009	-.0086	.6473
.6696	-.0319	-.0258	-.0203	-.0094	-.0003	.0148	.0127	.0154	.0121	.0008	.6696
.6920	-.0307	-.0234	-.0156	-.0047	.0056	.0148	.0139	.0236	.0180	.0044	.6920
.7143	-.0307	-.0223	-.0144	-.0024	.0091	.0137	.0163	.0260	.0192	.0079	.7143
.7366	-.0260	-.0211	-.0132	.0012	.0114	.0172	.0269	.0213	.0180	.0103	.7366
.7589	.0174	-.0011	-.0085	.0071	.0162	.0702	.0681	.0401	.0216	.0150	.7589
.7813	.1160	.0787	.0351	.0271	.0338	.3033	.2802	.2147	.1290	.0609	.7813
.8036	.1394	.1363	.1329	.1392	.1893	.3374	.3167	.2878	.2612	.2105	.8036
.8259	.1641	.1656	.1953	.2335	.2788	.3421	.3273	.3055	.2931	.2647	.8259
.8482	.1793	.1844	.2177	.2559	.2800	.3433	.3309	.3161	.2978	.2741	.8482
.8705	.1911	.1962	.2283	.2559	.2753	.3445	.3356	.3185	.2990	.2741	.8705
.8929	.2028	.2091	.2354	.2559	.2765	.3397	.3344	.3161	.2943	.2682	.8929
.9152	.2051	.2114	.2330	.2465	.2670	.3409	.3332	.3149	.2907	.2647	.9152
.9375	.2098	.2161	.2318	.2441	.2670	.3397	.3321	.3149	.2872	.2611	.9375
.9598	.2110	.2197	.2283	.2418	.2647	.3397	.3332	.3161	.2872	.2611	.9598
.9821	.2122	.2173	.2248	.2394	.2623	.3362	.3297	.3114	.2836	.2564	.9821
1.0045	.2133	.2173	.2224	.2394	.2611	.3421	.3332	.3126	.2872	.2600	1.0045
1.0268	.2145	.2173	.2224	.2394	.2623	.3397	.3332	.3114	.2860	.2588	1.0268
1.0491	.2133	.2138	.2212	.2370	.2611	.3397	.3344	.3114	.2848	.2576	1.0491
1.0714	.2145	.2138	.2224	.2394	.2611	.3445	.3356	.3126	.2848	.2588	1.0714
1.0938	.2169	.2150	.2236	.2418	.2623	.3292	.3203	.2984	.2718	.2470	1.0938

TABLE IX.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 2.30$ - Continued

(c) $\alpha = 8°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6460	1.6504	1.6559	1.6567	1.6577	1.6460	1.6504	1.6559	1.6567	1.6577	.0000
.0223	1.5334	1.5425	1.5664	1.5884	1.6201	1.6882	1.6855	1.6747	1.6520	1.6201	.0223
.0446	1.3716	1.3831	1.4157	1.4612	1.5121	1.6577	1.6480	1.6182	1.5695	1.5192	.0446
.0670	1.1558	1.1908	1.2321	1.2892	1.3618	1.5475	1.5331	1.4911	1.4211	1.3477	.0670
.0893	.9190	.9305	.9849	1.0513	1.1435	1.3904	1.3713	1.3216	1.2421	1.1552	.0893
.1116	.7384	.7593	.7989	.8747	.9674	1.2051	1.1837	1.1261	1.0443	.9462	.1116
.1339	.5602	.5811	.6246	.6910	.7795	1.0151	.9938	.9354	.8535	.7607	.1339
.1563	.3913	.4076	.4386	.5002	.5870	.8087	.7898	.7330	.6486	.5588	.1563
.1786	.2553	.2716	.3021	.3612	.4344	.6657	.6444	.5823	.5049	.4203	.1786
.2009	.1638	.1755	.2032	.2552	.3264	.5390	.5202	.4645	.3895	.3146	.2009
.2232	.0747	.0840	.1114	.1539	.2160	.4054	.3842	.3374	.2717	.2089	.2232
.2455	.0137	.0231	.0454	.0856	.1409	.2881	.2693	.2291	.1751	.1221	.2455
.2679	-.0402	-.0309	-.0111	.0244	.0728	.2013	.1848	.1490	.1021	.0516	.2679
.2902	-.0895	-.0825	-.0676	-.0369	-.0000	.1075	.0957	.0431	.0267	-.0141	.2902
.3125	-.1270	-.1176	-.1052	-.0816	-.0470	.0512	.0395	.0172	-.0204	-.0540	.3125
.3348	-.1293	-.1247	-.1099	-.0887	-.0540	.0489	.0371	.0172	-.0227	-.0564	.3348
.3571	-.1270	-.1200	-.1099	-.0863	-.0517						.3571
.3795	-.1243	-.1197	-.1049	-.0802	-.0498	.0563	.0448	.0181	-.0154	-.0533	.3795
.4018	-.1184	-.1126	-.1002	-.0767	-.0439	.0574	.0472	.0204	-.0130	-.0498	.4018
.4241	-.1102	-.1079	-.0967	-.0743	-.0439	.0610	.0507	.0240	-.0095	-.0475	.4241
.4464	-.1031	-.1009	-.0943	-.0720	-.0416	.0598	.0507	.0240	-.0083	-.0451	.4464
.4688	-.0973	-.0962	-.0908	-.0696	-.0392	.0621	.0519	.0263	-.0071	-.0427	.4688
.4911	-.0926	-.0915	-.0884	-.0684	-.0392	.0621	.0531	.0263	-.0060	-.0416	.4911
.5134	-.0890	-.0891	-.0849	-.0673	-.0380	.0657	.0554	.0275	-.0048	-.0404	.5134
.5357	-.0867	-.0856	-.0837	-.0661	-.0380	.0633	.0554	.0275	-.0048	-.0404	.5357
.5580	-.0832	-.0821	-.0802	-.0649	-.0369	.0633	.0542	.0275	-.0048	-.0404	.5580
.5804	-.0785	-.0774	-.0766	-.0637	-.0369	.0633	.0531	.0275	-.0048	-.0404	.5804
.6027	-.0749	-.0727	-.0731	-.0637	-.0369	.0657	.0542	.0287	-.0048	-.0392	.6027
.6250	-.0691	-.0680	-.0672	-.0625	-.0369	.0621	.0531	.0275	-.0048	-.0392	.6250
.6473	-.0632	-.0633	-.0601	-.0602	-.0369	.0633	.0542	.0275	-.0048	-.0392	.6473
.6696	-.0608	-.0586	-.0554	-.0508	-.0310	.0657	.0542	.0322	-.0012	-.0345	.6696
.6920	-.0561	-.0539	-.0495	-.0413	-.0157	.0657	.0601	.0511	.0129	-.0215	.6920
.7143	-.0479	-.0492	-.0436	-.0354	-.0074	.0621	.0742	.0641	.0247	-.0121	.7143
.7366	-.0267	-.0398	-.0377	-.0295	-.0027	.0657	.0801	.0688	.0294	-.0074	.7366
.7589	.0050	-.0163	-.0318	-.0236	.0020	.1210	.0918	.0724	.0330	.0032	.7589
.7813	.0544	.0307	-.0011	.0082	.0373	.3814	.3209	.1420	.1355	.0868	.7813
.8036	.0931	.1059	.1180	.1497	.2022	.4202	.3950	.3782	.3018	.2293	.8036
.8259	.1249	.1506	.1899	.2027	.2493	.4273	.4079	.3782	.3065	.2399	.8259
.8482	.1484	.1741	.1911	.1992	.2446	.4285	.4114	.3746	.3053	.2387	.8482
.8705	.1613	.1811	.1852	.1921	.2340	.4320	.4149	.3723	.3018	.2340	.8705
.8929	.1731	.1858	.1864	.1921	.2376	.4273	.4114	.3652	.2971	.2293	.8929
.9152	.1766	.1835	.1805	.1886	.2329	.4273	.4102	.3628	.2935	.2281	.9152
.9375	.1801	.1811	.1793	.1898	.2340	.4273	.4091	.3593	.2912	.2270	.9375
.9598	.1801	.1788	.1758	.1886	.2329	.4320	.4102	.3581	.2912	.2281	.9598
.9821	.1789	.1741	.1734	.1874	.2317	.4273	.4067	.3546	.2888	.2234	.9821
1.0045	.1789	.1729	.1734	.1874	.2293	.4332	.4126	.3581	.2923	.2281	1.0045
1.0268	.1778	.1717	.1734	.1874	.2317	.4332	.4114	.3569	.2923	.2270	1.0268
1.0491	.1742	.1682	.1711	.1862	.2293	.4344	.4126	.3569	.2900	.2270	1.0491
1.0714	.1742	.1682	.1711	.1862	.2317	.4379	.4138	.3593	.2912	.2293	1.0714
1.0938	.1742	.1706	.1711	.1886	.2329	.4191	.3950	.3428	.2782	.2175	1.0938

TABLE IX.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 2.30 - Concluded

(d) α = 12°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.5965	1.6005	1.6106	1.6132	1.6132	1.5965	1.6005	1.6106	1.6132	1.6132	.0000
.0223	1.4488	1.4666	1.4953	1.5378	1.5780	1.6716	1.6757	1.6553	1.6273	1.5803	.0223
.0446	1.2682	1.2856	1.3305	1.3966	1.4745	1.6763	1.6687	1.6224	1.5614	1.4816	.0446
.0670	1.0619	1.0788	1.1375	1.2247	1.3311	1.6059	1.5864	1.5235	1.4272	1.3170	.0670
.0893	.7946	.8203	.8809	.9823	1.1124	1.4769	1.4572	1.3799	1.2624	1.1336	.0893
.1116	.6140	.6394	.6997	.8104	.9478	1.3128	1.2833	1.1963	1.0717	.9314	.1116
.1339	.4428	.4702	.5326	.6315	.7645	1.1299	1.0976	1.0057	.8834	.7457	.1339
.1563	.2904	.3104	.3631	.4503	.5740	.9353	.9002	.8103	.6857	.5482	.1563
.1786	.1731	.1905	.2384	.3185	.4329	.7899	.7498	.6620	.5397	.4141	.1786
.2009	.0864	.1036	.1489	.2219	.3224	.6539	.6206	.5349	.4267	.3107	.2009
.2232	.0113	.0260	.0618	.1254	.2143	.5061	.4772	.4008	.3067	.2049	.2232
.2455	-.0402	-.0257	.0077	.0595	.1414	.3818	.3503	.2878	.2031	.1179	.2455
.2679	-.0848	-.0727	-.0417	.0054	.0709	.2857	.2587	.2031	.1278	.0521	.2679
.2902	-.1270	-.1150	-.0935	-.0558	.0027	.1778	.1600	.1113	.0454	-.0161	.2902
.3125	-.1551	-.1479	-.1265	-.0959	-.0467	.1145	.0989	.0571	.0007	-.0537	.3125
.3348	-.1575	-.1502	-.1312	-.1029	-.0537	.1098	.0942	.0548	-.0040	-.0561	.3348
.3571	-.1528	-.1479	-.1288	-.1006	-.0537						.3571
.3795	-.1362	-.1383	-.1262	-.0967	-.0498	.1198	.1016	.0572	.0024	-.0545	.3795
.4018	-.1292	-.1313	-.1227	-.0920	-.0463	.1210	.1040	.0596	.0047	-.0533	.4018
.4241	-.1268	-.1266	-.1191	-.0920	-.0463	.1257	.1063	.0620	.0059	-.0498	.4241
.4464	-.1245	-.1242	-.1180	-.0908	-.0451	.1234	.1063	.0620	.0059	-.0498	.4464
.4688	-.1233	-.1218	-.1144	-.0896	-.0439	.1257	.1087	.0631	.0071	-.0486	.4688
.4911	-.1221	-.1195	-.1133	-.0884	-.0439	.1257	.1075	.0631	.0071	-.0486	.4911
.5134	-.1198	-.1171	-.1109	-.0872	-.0439	.1292	.1087	.0631	.0071	-.0486	.5134
.5357	-.1163	-.1136	-.1097	-.0872	-.0439	.1269	.1075	.0620	.0047	-.0498	.5357
.5580	-.1127	-.1089	-.1085	-.0872	-.0439	.1245	.1075	.0608	.0047	-.0510	.5580
.5804	-.1069	-.1019	-.1062	-.0861	-.0439	.1245	.1052	.0596	.0036	-.0521	.5804
.6027	-.1010	-.0960	-.1050	-.0896	-.0474	.1257	.1063	.0596	.0024	-.0510	.6027
.6250	-.0951	-.0913	-.1026	-.0908	-.0486	.1234	.1040	.0572	.0012	-.0533	.6250
.6473	-.0881	-.0877	-.0968	-.0920	-.0498	.1234	.1028	.0561	.0000	-.0545	.6473
.6696	-.0834	-.0854	-.0909	-.0943	-.0533	.1234	.1040	.0572	.0000	-.0557	.6696
.6920	-.0752	-.0842	-.0861	-.0955	-.0545	.1234	.1075	.0608	-.0012	-.0580	.6920
.7143	-.0611	-.0819	-.0838	-.0955	-.0498	.1175	.1346	.0820	.0059	-.0604	.7143
.7366	-.0282	-.0772	-.0838	-.0908	-.0380	.1222	.1452	.0927	.0213	-.0533	.7366
.7589	.0093	-.0572	-.0791	-.0731	-.0168	.2023	.1475	.0962	.0625	-.0215	.7589
.7813	.0528	.0099	-.0319	.0555	.0621	.4744	.3592	.2995	.1852	.1469	.7813
.8036	.0950	.0899	.0718	.1097	.1799	.5203	.5204	.4235	.3008	.1929	.8036
.8259	.1279	.1346	.1072	.1050	.1964	.5262	.5168	.4223	.2996	.1870	.8259
.8482	.1479	.1510	.1060	.1121	.1940	.5333	.5110	.4188	.2949	.1823	.8482
.8705	.1608	.1557	.1001	.1073	.1870	.5368	.5086	.4164	.2960	.1799	.8705
.8929	.1667	.1604	.1025	.1109	.1905	.5356	.5015	.4093	.2925	.1799	.8929
.9152	.1667	.1546	.0989	.1073	.1870	.5344	.4992	.4093	.2925	.1799	.9152
.9375	.1655	.1510	.0989	.1085	.1870	.5344	.4968	.4070	.2890	.1799	.9375
.9598	.1620	.1487	.0989	.1062	.1858	.5368	.4980	.4070	.2925	.1811	.9598
.9821	.1573	.1428	.0978	.1050	.1846	.5356	.4945	.4046	.2878	.1811	.9821
1.0045	.1537	.1381	.0978	.1062	.1858	.5403	.5004	.4093	.2949	.1858	1.0045
1.0268	.1514	.1369	.1001	.1097	.1881	.5391	.4980	.4105	.2960	.1858	1.0268
1.0491	.1479	.1322	.0989	.1097	.1893	.5403	.5015	.4093	.2984	.1881	1.0491
1.0714	.1455	.1322	.1025	.1121	.1940	.5391	.5039	.4129	.3008	.1929	1.0714
1.0938	.1455	.1346	.1072	.1156	.1964	.5168	.4816	.3952	.2913	.1787	1.0938

TABLE X.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 2.96$

(a) $\alpha = 0°$

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.7318	1.7318	1.7297	1.7303	1.7294	1.7318	1.7318	1.7297	1.7303	1.7294	.0000
.0223	1.6903	1.6931	1.6910	1.6915	1.6934	1.6930	1.6931	1.6937	1.6971	1.6962	.0223
.0446	1.5795	1.5825	1.5803	1.5808	1.5800	1.5822	1.5825	1.5830	1.5864	1.5855	.0446
.0670	1.4160	1.4165	1.4198	1.4175	1.4195	1.3994	1.3999	1.3976	1.4037	1.4029	.0670
.0893	1.1889	1.1896	1.1901	1.1905	1.1899	1.1889	1.1896	1.1873	1.1905	1.1927	.0893
.1116	.9977	.9988	.9992	.9995	.9990	.9700	.9683	.9687	.9691	.9713	.1116
.1339	.8121	.8134	.8138	.8141	.8108	.7899	.7913	.7889	.7892	.7887	.1339
.1563	.6154	.6198	.6173	.6203	.6144	.5877	.5894	.5841	.5843	.5867	.1563
.1786	.4630	.4649	.4651	.4625	.4622	.4409	.4428	.4402	.4432	.4429	.1786
.2009	.3495	.3515	.3516	.3490	.3516	.3356	.3376	.3378	.3352	.3377	.2009
.2232	.2442	.2464	.2465	.2466	.2464	.2303	.2325	.2327	.2328	.2354	.2232
.2455	.1694	.1744	.1718	.1747	.1745	.1472	.1495	.1496	.1497	.1524	.2455
.2679	.1057	.1108	.1081	.1082	.1109	.0890	.0914	.0915	.0916	.0915	.2679
.2902	.0420	.0444	.0445	.0446	.0472	.0309	.0334	.0307	.0335	.0334	.2902
.3125	.0004	.0029	.0030	.0030	.0030	-.0051	-.0054	-.0026	-.0053	-.0026	.3125
.3348	-.0079	-.0054	-.0053	-.0053	-.0053	-.0079	-.0081	-.0081	-.0080	-.0081	.3348
.3571	-.0107	-.0054	-.0081	-.0053	-.0053						.3571
.3795	-.0091	-.0091	-.0090	-.0090	-.0077	-.0077	-.0089	-.0066	-.0062	-.0039	.3795
.4018	-.0077	-.0077	-.0077	-.0076	-.0077	-.0077	-.0089	-.0052	-.0062	-.0039	.4018
.4241	-.0077	-.0077	-.0077	-.0076	-.0077	-.0077	-.0089	-.0052	-.0062	-.0039	.4241
.4464	-.0077	-.0077	-.0077	-.0076	-.0077	-.0077	-.0089	-.0052	-.0062	-.0039	.4464
.4688	-.0077	-.0063	-.0077	-.0076	-.0063	-.0063	-.0075	-.0052	-.0062	-.0025	.4688
.4911	-.0077	-.0077	-.0077	-.0076	-.0063	-.0063	-.0075	-.0038	-.0048	-.0025	.4911
.5134	-.0077	-.0063	-.0063	-.0076	-.0063	-.0063	-.0075	-.0038	-.0048	-.0025	.5134
.5357	-.0063	-.0063	-.0063	-.0062	-.0049	-.0035	-.0048	-.0011	-.0021	.0003	.5357
.5580	-.0049	-.0035	-.0035	-.0021	-.0008	.0034	.0036	.0072	.0049	.0072	.5580
.5804	.0048	.0048	.0048	.0076	.0089	.0117	.0119	.0169	.0146	.0182	.5804
.6027	.0117	.0117	.0132	.0146	.0145	.0173	.0175	.0211	.0187	.0224	.6027
.6250	.0159	.0159	.0159	.0174	.0187	.0201	.0188	.0225	.0215	.0238	.6250
.6473	.0187	.0186	.0187	.0201	.0200	.0215	.0202	.0238	.0229	.0252	.6473
.6696	.0187	.0200	.0201	.0201	.0200	.0228	.0216	.0252	.0229	.0266	.6696
.6920	.0201	.0200	.0201	.0201	.0200	.0228	.0216	.0252	.0229	.0266	.6920
.7143	.0201	.0200	.0201	.0201	.0200	.0228	.0216	.0238	.0229	.0266	.7143
.7366	.0201	.0200	.0201	.0201	.0200	.0215	.0202	.0238	.0229	.0252	.7366
.7589	.0201	.0200	.0201	.0201	.0200	.0215	.0202	.0225	.0229	.0252	.7589
.7813	.0284	.0297	.0312	.0312	.0311	.0298	.0286	.0321	.0285	.0293	.7813
.8036	.0797	.0838	.0867	.0868	.0838	.0853	.0841	.0861	.0798	.0805	.8036
.8259	.1643	.1657	.1658	.1645	.1587	.1685	.1619	.1623	.1575	.1594	.8259
.8482	.1935	.1934	.1921	.1922	.1879	.2004	.1952	.1955	.1950	.1982	.8482
.8705	.2046	.2031	.2032	.2019	.2004	.2074	.2035	.2052	.2061	.2079	.8705
.8929	.2087	.2087	.2074	.2075	.2073	.2087	.2063	.2066	.2075	.2120	.8929
.9152	.2101	.2087	.2088	.2089	.2087	.2087	.2077	.2093	.2103	.2134	.9152
.9375	.2115	.2100	.2102	.2103	.2087	.2101	.2091	.2107	.2103	.2148	.9375
.9598	.2129	.2128	.2116	.2117	.2114	.2115	.2105	.2135	.2130	.2175	.9598
.9821	.2129	.2128	.2129	.2130	.2114	.2101	.2091	.2121	.2117	.2175	.9821
1.0045	.2129	.2142	.2129	.2144	.2128	.2143	.2132	.2163	.2158	.2203	1.0045
1.0268	.2157	.2156	.2157	.2158	.2142	.2143	.2132	.2163	.2172	.2203	1.0268
1.0491	.2157	.2156	.2157	.2158	.2142	.2157	.2146	.2176	.2186	.2217	1.0491
1.0714	.2184	.2184	.2185	.2172	.2170	.2184	.2160	.2190	.2200	.2245	1.0714
1.0938	.2240	.2239	.2240	.2241	.2239	.2115	.2105	.2149	.2158	.2203	1.0938

TABLE X.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 2.96 - Continued

(b) α = 4°

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.7240	1.7234	1.7270	1.7256	1.7271	1.7240	1.7234	1.7270	1.7256	1.7271	.0000
.0223	1.6437	1.6458	1.6605	1.6729	1.6911	1.7240	1.7206	1.7215	1.7062	1.6938	.0223
.0446	1.5023	1.5073	1.5275	1.5509	1.5802	1.6492	1.6431	1.6328	1.6091	1.5830	.0446
.0670	1.3195	1.3245	1.3529	1.3817	1.4167	1.4996	1.4907	1.4748	1.4372	1.4028	.0670
.0893	1.0701	1.0780	1.1007	1.1377	1.1839	1.3056	1.2968	1.2780	1.2347	1.1950	.0893
.1116	.8761	.8868	.9150	.9491	.9954	1.0950	1.0863	1.0619	1.0212	.9733	.1116
.1339	.6904	.7012	.7265	.7633	.8097	.9093	.8979	.8734	.8354	.7931	.1339
.1563	.5075	.5129	.5353	.5664	.6102	.7015	.5544	.6656	.6246	.5880	.1563
.1786	.3690	.3744	.3940	.4221	.4578	.5491	.5406	.5159	.4776	.4439	.1786
.2009	.2692	.2746	.2915	.3140	.3497	.4327	.4242	.4023	.3694	.3386	.2009
.2232	.1750	.1777	.1945	.2141	.2444	.3163	.3079	.2887	.2585	.2333	.2232
.2455	.1113	.1140	.1279	.1420	.1695	.2194	.2137	.2000	.1725	.1529	.2455
.2679	.0559	.0586	.0697	.0838	.1086	.1501	.1444	.1307	.1115	.0919	.2679
.2902	.0060	.0059	.0143	.0255	.0448	.0808	.0752	.0642	.0450	.0310	.2902
.3125	-.0300	-.0273	-.0217	-.0188	.0005	.0365	.0309	.0254	.0061	-.0023	.3125
.3348	-.0384	-.0384	-.0273	-.0216	-.0078	.0337	.0281	.0199	.0061	-.0078	.3348
.3571	-.0384	-.0384	-.0300	-.0216	-.0078						.3571
.3795	-.0395	-.0354	-.0299	-.0228	-.0090	.0312	.0282	.0210	.0088	-.0052	.3795
.4018	-.0382	-.0340	-.0272	-.0200	-.0090	.0312	.0268	.0210	.0088	-.0052	.4018
.4241	-.0368	-.0340	-.0272	-.0200	-.0090	.0312	.0282	.0210	.0088	-.0038	.4241
.4464	-.0284	-.0299	-.0272	-.0200	-.0090	.0298	.0268	.0210	.0088	-.0038	.4464
.4688	-.0187	-.0215	-.0258	-.0200	-.0090	.0298	.0268	.0210	.0088	-.0038	.4688
.4911	-.0146	-.0132	-.0202	-.0200	-.0090	.0298	.0268	.0210	.0088	-.0038	.4911
.5134	-.0118	-.0091	-.0119	-.0186	-.0090	.0298	.0268	.0210	.0088	-.0038	.5134
.5357	-.0104	-.0077	-.0064	-.0158	-.0090	.0285	.0254	.0196	.0074	-.0038	.5357
.5580	-.0104	-.0077	-.0022	-.0145	-.0090	.0285	.0240	.0196	.0074	-.0038	.5580
.5804	-.0090	-.0077	.0006	-.0089	-.0090	.0271	.0240	.0182	.0074	-.0038	.5804
.6027	-.0104	-.0104	-.0008	-.0061	-.0090	.0271	.0240	.0182	.0074	-.0024	.6027
.6250	-.0090	-.0104	-.0008	-.0033	-.0048	.0257	.0240	.0182	.0088	.0031	.6250
.6473	-.0062	-.0104	-.0022	-.0006	.0035	.0271	.0240	.0223	.0171	.0128	.6473
.6696	-.0048	-.0063	.0006	.0036	.0118	.0326	.0323	.0348	.0282	.0197	.6696
.6920	-.0048	-.0021	.0033	.0050	.0160	.0437	.0448	.0431	.0337	.0225	.6920
.7143	-.0048	-.0021	-.0008	.0064	.0188	.0520	.0517	.0472	.0365	.0253	.7143
.7366	-.0035	.0006	-.0050	.0078	.0201	.0576	.0531	.0486	.0393	.0281	.7366
.7589	.0035	.0090	-.0064	.0105	.0215	.0632	.0559	.0486	.0406	.0281	.7589
.7813	.0160	.0256	.0075	.0119	.0215	.1076	.0864	.0542	.0420	.0294	.7813
.8036	.0396	.0506	.0519	.0564	.0771	.2463	.2347	.1925	.1418	.1014	.8036
.8259	.0645	.0742	.0990	.1605	.1881	.2741	.2707	.2603	.2319	.1998	.8259
.8482	.0867	.0950	.1309	.1911	.2075	.2796	.2735	.2631	.2416	.2164	.8482
.8705	.1020	.1102	.1475	.1911	.2075	.2810	.2748	.2631	.2416	.2178	.8705
.8929	.1159	.1227	.1600	.1911	.2089	.2824	.2748	.2631	.2402	.2164	.8929
.9152	.1228	.1311	.1628	.1883	.2075	.2824	.2762	.2617	.2388	.2150	.9152
.9375	.1298	.1380	.1669	.1883	.2075	.2852	.2776	.2617	.2402	.2164	.9375
.9598	.1353	.1421	.1683	.1883	.2103	.2866	.2804	.2631	.2416	.2178	.9598
.9821	.1395	.1449	.1683	.1883	.2089	.2866	.2790	.2617	.2388	.2150	.9821
1.0045	.1423	.1491	.1683	.1883	.2103	.2907	.2832	.2658	.2416	.2178	1.0045
1.0268	.1464	.1519	.1697	.1883	.2117	.2907	.2845	.2672	.2429	.2178	1.0268
1.0491	.1478	.1532	.1697	.1883	.2117	.2935	.2859	.2686	.2443	.2192	1.0491
1.0714	.1506	.1560	.1711	.1911	.2131	.2977	.2887	.2714	.2471	.2205	1.0714
1.0938	.1575	.1616	.1767	.1939	.2200	.2880	.2818	.2644	.2416	.2150	1.0938

TABLE X.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 2.96$ - Continued

(c) $\alpha = 8°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6939	1.6996	1.7012	1.7034	1.7110	1.6939	1.6996	1.7012	1.7034	1.7110	.0000
.0223	1.5777	1.5889	1.6070	1.6370	1.6694	1.7327	1.7328	1.7205	1.7007	1.6749	.0223
.0446	1.4089	1.4228	1.4546	1.5013	1.5585	1.6967	1.6913	1.6624	1.6148	1.5640	.0446
.0670	1.2068	1.2263	1.2663	1.3241	1.3949	1.5777	1.5640	1.5239	1.4570	1.3894	.0670
.0893	.9495	.9606	1.0087	1.0776	1.1676	1.4116	1.3979	1.3466	1.2714	1.1870	.0893
.1116	.7530	.7752	.8148	.8893	.9791	1.2179	1.1987	1.1444	1.0610	.9652	.1116
.1339	.5759	.5925	.6347	.7010	.7934	1.0242	1.0077	.9477	.8671	.7795	.1339
.1563	.4070	.4209	.4574	.5182	.5993	.8166	.7973	.7400	.6622	.5827	.1563
.1786	.2825	.2964	.3300	.3520	.4524	.6617	.6451	.5876	.5154	.4413	.1786
.2009	.1940	.2078	.2331	.2800	.3415	.5343	.5206	.4685	.4019	.3359	.2009
.2232	.1137	.1220	.1444	.1831	.2417	.4043	.3905	.3494	.2939	.2334	.2232
.2455	.0583	.0667	.0863	.1222	.1696	.2963	.2853	.2497	.2025	.1502	.2455
.2679	.0390	.0196	.0364	.0640	.1059	.2189	.2078	.1749	.1360	.0892	.2679
.2902	-.0274	-.0219	-.0135	.0114	.0421	.1386	.1276	.1029	.0640	.0310	.2902
.3125	-.0579	-.0523	-.0439	-.0246	.0033	.0860	.0805	.0558	.0253	-.0023	.3125
.3348	-.0662	-.0606	-.0522	-.0329	-.0078	.0805	.0722	.0502	.0197	-.0078	.3348
.3571	-.0634	-.0606	-.0522	-.0329	-.0078						.3571
.3795	-.0534	-.0576	-.0494	-.0341	-.0090	.0761	.0676	.0513	.0224	-.0052	.3795
.4018	-.0437	-.0506	-.0480	-.0327	-.0090	.0761	.0662	.0513	.0224	-.0052	.4018
.4241	-.0410	-.0437	-.0466	-.0327	-.0090	.0761	.0662	.0499	.0224	-.0052	.4241
.4464	-.0382	-.0409	-.0453	-.0327	-.0104	.0747	.0648	.0485	.0224	-.0065	.4464
.4688	-.0382	-.0382	-.0439	-.0327	-.0104	.0733	.0648	.0485	.0210	-.0065	.4688
.4911	-.0368	-.0368	-.0411	-.0327	-.0104	.0720	.0634	.0471	.0210	-.0065	.4911
.5134	-.0368	-.0368	-.0397	-.0327	-.0117	.0720	.0634	.0471	.0196	-.0065	.5134
.5357	-.0368	-.0368	-.0383	-.0327	-.0117	.0706	.0620	.0457	.0182	-.0079	.5357
.5580	-.0368	-.0368	-.0369	-.0327	-.0131	.0692	.0606	.0444	.0182	-.0079	.5580
.5804	-.0354	-.0354	-.0356	-.0313	-.0117	.0678	.0592	.0416	.0154	-.0093	.5804
.6027	-.0354	-.0368	-.0356	-.0327	-.0145	.0678	.0578	.0416	.0154	-.0093	.6027
.6250	-.0354	-.0368	-.0328	-.0313	-.0145	.0650	.0578	.0416	.0141	-.0107	.6250
.6473	-.0340	-.0354	-.0286	-.0271	-.0145	.0650	.0564	.0402	.0141	-.0093	.6473
.6696	-.0299	-.0354	-.0245	-.0188	-.0076	.0650	.0578	.0416	.0182	-.0010	.6696
.6920	-.0243	-.0340	-.0217	-.0119	.0035	.0636	.0690	.0554	.0334	.0101	.6920
.7143	-.0201	-.0298	-.0175	-.0091	.0105	.0636	.0856	.0692	.0417	.0156	.7143
.7366	-.0146	-.0229	-.0134	-.0063	.0132	.0747	.0912	.0748	.0459	.0184	.7366
.7589	-.0090	-.0160	-.0106	-.0050	.0146	.1067	.0912	.0762	.0473	.0198	.7589
.7813	.0007	-.0146	-.0106	-.0063	.0132	.2875	.1412	.0900	.0528	.0212	.7813
.8036	.0159	.0243	.0171	.0408	.0979	.3473	.3287	.2780	.2022	.1306	.8036
.8259	.0340	.0659	.0864	.1254	.1770	.3542	.3482	.3071	.2451	.1860	.8259
.8482	.0506	.1006	.1280	.1462	.1868	.3570	.3482	.3071	.2479	.1929	.8482
.8705	.0631	.1214	.1321	.1462	.1854	.3626	.3496	.3085	.2493	.1943	.8705
.8929	.0756	.1311	.1335	.1490	.1881	.3668	.3510	.3098	.2493	.1943	.8929
.9152	.0825	.1284	.1307	.1462	.1881	.3681	.3524	.3098	.2507	.1929	.9152
.9375	.0895	.1256	.1293	.1462	.1881	.3709	.3537	.3112	.2493	.1929	.9375
.9598	.0964	.1228	.1293	.1462	.1895	.3765	.3579	.3154	.2534	.1943	.9598
.9821	.0992	.1200	.1280	.1462	.1909	.3765	.3579	.3154	.2534	.1943	.9821
1.0045	.1033	.1173	.1280	.1462	.1909	.3834	.3635	.3209	.2576	.1971	1.0045
1.0268	.1061	.1173	.1293	.1476	.1923	.3848	.3662	.3223	.2590	.1984	1.0268
1.0491	.1075	.1159	.1280	.1476	.1923	.3904	.3676	.3237	.2617	.1998	1.0491
1.0714	.1089	.1159	.1293	.1490	.1937	.3946	.3732	.3278	.2631	.2026	1.0714
1.0938	.1131	.1228	.1363	.1531	.1992	.3848	.3649	.3195	.2576	.1957	1.0938

TABLE X.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 2.96 - Concluded

(d) α = 12°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.6472	1.6539	1.6576	1.6622	1.6688	1.6472	1.6539	1.6576	1.6622	1.6688	.0000
.0223	1.5005	1.5126	1.5412	1.5819	1.6328	1.7275	1.7259	1.7075	1.6733	1.6383	.0223
.0446	1.3123	1.3271	1.3694	1.4351	1.5164	1.7247	1.7148	1.6715	1.6040	1.5303	.0446
.0670	1.0991	1.1193	1.1727	1.2551	1.3640	1.6472	1.6262	1.5634	1.4656	1.3584	.0670
.0893	.8334	.8562	.9149	1.0086	1.1367	1.5116	1.4877	1.4082	1.2911	1.1644	.0893
.1116	.6397	.6596	.7210	.8257	.9594	1.3344	1.3021	1.2170	1.0889	.9483	.1116
.1339	.4708	.4851	.5519	.6457	.7764	1.1434	1.1110	1.0230	.8950	.7654	.1339
.1563	.3158	.3355	.3884	.4657	.5852	.9386	.9061	.8179	.6956	.5686	.1563
.1786	.2079	.2219	.2693	.3410	.4439	.7836	.7482	.6655	.5488	.4328	.1786
.2009	.1331	.1444	.1833	.2469	.3386	.6507	.6180	.5381	.4352	.3330	.2009
.2232	.0612	.0696	.1058	.1582	.2360	.5096	.4795	.4106	.3189	.2305	.2232
.2455	.0169	.0225	.0503	.0973	.1667	.3905	.3632	.3053	.2275	.1501	.2455
.2679	-.0219	-.0190	.0060	.0419	.1058	.2964	.2746	.2221	.1555	.0919	.2679
.2902	-.0551	-.0550	-.0356	-.0024	.0420	.2023	.1832	.1418	.0862	.0337	.2902
.3125	-.0772	-.0772	-.0633	-.0412	.0032	.1470	.1278	.0891	.0391	-.0023	.3125
.3348	-.0717	-.0800	-.0688	-.0440	-.0079	.1387	.1222	.0836	.0364	-.0079	.3348
.3571	-.0634	-.0716	-.0688	-.0440	-.0079						.3571
.3795	-.0617	-.0646	-.0673	-.0438	-.0090	.1339	.1186	.0849	.0388	-.0052	.3795
.4018	-.0604	-.0618	-.0659	-.0438	-.0090	.1326	.1172	.0821	.0374	-.0066	.4018
.4241	-.0590	-.0604	-.0645	-.0438	-.0104	.1326	.1172	.0821	.0360	-.0066	.4241
.4464	-.0590	-.0590	-.0631	-.0451	-.0104	.1298	.1144	.0807	.0347	-.0080	.4464
.4688	-.0590	-.0590	-.0617	-.0451	-.0118	.1298	.1130	.0793	.0347	-.0080	.4688
.4911	-.0590	-.0590	-.0603	-.0451	-.0146	.1284	.1116	.0779	.0333	-.0094	.4911
.5134	-.0590	-.0590	-.0589	-.0465	-.0146	.1284	.1116	.0765	.0319	-.0094	.5134
.5357	-.0590	-.0590	-.0589	-.0479	-.0160	.1256	.1089	.0752	.0291	-.0121	.5357
.5580	-.0590	-.0590	-.0589	-.0479	-.0174	.1242	.1075	.0738	.0277	-.0135	.5580
.5804	-.0576	-.0576	-.0576	-.0479	-.0174	.1215	.1047	.0710	.0264	-.0149	.5804
.6027	-.0576	-.0576	-.0589	-.0507	-.0201	.1215	.1047	.0710	.0264	-.0163	.6027
.6250	-.0576	-.0562	-.0562	-.0507	-.0201	.1187	.1033	.0682	.0236	-.0177	.6250
.6473	-.0548	-.0535	-.0520	-.0507	-.0229	.1187	.1019	.0668	.0222	-.0191	.6473
.6696	-.0479	-.0507	-.0478	-.0493	-.0229	.1187	.1019	.0668	.0236	-.0177	.6696
.6920	-.0395	-.0451	-.0451	-.0410	-.0146	.1173	.1047	.0710	.0305	-.0108	.6920
.7143	-.0298	-.0424	-.0423	-.0340	-.0021	.1131	.1283	.0932	.0471	.0003	.7143
.7366	-.0215	-.0396	-.0381	-.0313	.0021	.1159	.1421	.1029	.0540	.0045	.7366
.7589	-.0146	-.0313	-.0381	-.0299	.0049	.1395	.1449	.1070	.0582	.0072	.7589
.7813	-.0076	-.0243	-.0409	-.0313	.0035	.4060	.2046	.1347	.0665	.0239	.7813
.8036	.0021	.0048	-.0090	.0159	.0923	.4462	.4362	.3452	.2296	.1332	.8036
.8259	.0132	.0534	.0493	.0755	.1492	.4545	.4376	.3604	.2573	.1623	.8259
.8482	.0257	.0853	.0729	.0880	.1603	.4629	.4404	.3618	.2600	.1651	.8482
.8705	.0368	.0950	.0743	.0880	.1589	.4726	.4460	.3646	.2628	.1651	.8705
.8929	.0465	.0964	.0743	.0908	.1630	.4753	.4473	.3674	.2628	.1651	.8929
.9152	.0548	.0936	.0743	.0908	.1630	.4809	.4501	.3701	.2655	.1665	.9152
.9375	.0618	.0908	.0743	.0908	.1644	.4878	.4543	.3715	.2669	.1665	.9375
.9598	.0673	.0880	.0743	.0908	.1644	.4948	.4612	.3771	.2711	.1692	.9598
.9821	.0715	.0853	.0729	.0908	.1658	.4962	.4626	.3785	.2711	.1692	.9821
1.0045	.0743	.0825	.0729	.0908	.1658	.5059	.4709	.3854	.2766	.1720	1.0045
1.0268	.0770	.0811	.0729	.0908	.1672	.5100	.4737	.3881	.2780	.1734	1.0268
1.0491	.0798	.0797	.0715	.0908	.1672	.5142	.4779	.3923	.2794	.1734	1.0491
1.0714	.0798	.0797	.0715	.0936	.1700	.5198	.4820	.3978	.2835	.1762	1.0714
1.0938	.0812	.0853	.0798	.1005	.1769	.5045	.4709	.3868	.2752	.1720	1.0938

TABLE XI.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 3.95

(a) α = 0°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.7425	1.7459	1.7424	1.7425	1.7386	1.7425	1.7459	1.7424	1.7425	1.7386	.0000
.0223	1.7033	1.6996	1.6996	1.6962	1.6994	1.7069	1.7032	1.6996	1.6998	1.6994	.0223
.0446	1.5894	1.5893	1.5857	1.5858	1.5855	1.5929	1.5928	1.5893	1.5894	1.5926	.0446
.0670	1.4184	1.4148	1.4148	1.4149	1.4146	1.4077	1.4076	1.4005	1.4042	1.4039	.0670
.0893	1.1834	1.1833	1.1833	1.1834	1.1831	1.1869	1.1904	1.1833	1.1869	1.1831	.0893
.1116	.9804	.9803	.9768	.9768	.9802	.9590	.9554	.9518	.9519	.9552	.1116
.1339	.7881	.7880	.7845	.7845	.7915	.7738	.7738	.7702	.7703	.7701	.1339
.1563	.5958	.5957	.5922	.5922	.5956	.5495	.5779	.5708	.5744	.5778	.1563
.1786	.4533	.4533	.4533	.4498	.4532	.4355	.4355	.4319	.4355	.4318	.1786
.2009	.3465	.3464	.3464	.3429	.3464	.3322	.3358	.3322	.3322	.3321	.2009
.2232	.2468	.2503	.2467	.2468	.2467	.2396	.2396	.2361	.2361	.2396	.2232
.2455	.1755	.1791	.1755	.1755	.1755	.1613	.1613	.1613	.1613	.1612	.2455
.2679	.1221	.1221	.1185	.1186	.1221	.1079	.1079	.1043	.1079	.1078	.2679
.2902	.0651	.0687	.0651	.0651	.0687	.0580	.0580	.0544	.0545	.0580	.2902
.3125	.0295	.0295	.0260	.0260	.0295	.0260	.0260	.0260	.0224	.0259	.3125
.3348	.0224	.0224	.0188	.0188	.0224	.0224	.0224	.0188	.0188	.0224	.3348
.3571	.0188	.0224	.0153	.0153	.0153						.3571
.3795	.0173	.0174	.0190	.0156	.0173	.0188	.0139	.0138	.0138	.0122	.3795
.4018	.0173	.0174	.0172	.0156	.0173	.0170	.0121	.0138	.0120	.0104	.4018
.4241	.0155	.0156	.0154	.0138	.0138	.0170	.0121	.0121	.0120	.0104	.4241
.4464	.0137	.0138	.0154	.0120	.0138	.0152	.0103	.0103	.0102	.0086	.4464
.4688	.0137	.0120	.0136	.0102	.0120	.0135	.0103	.0103	.0084	.0086	.4688
.4911	.0119	.0120	.0118	.0102	.0120	.0135	.0086	.0085	.0084	.0069	.4911
.5134	.0119	.0120	.0118	.0102	.0120	.0152	.0103	.0103	.0102	.0086	.5134
.5357	.0155	.0156	.0154	.0138	.0156	.0224	.0175	.0174	.0174	.0140	.5357
.5580	.0226	.0227	.0225	.0209	.0245	.0295	.0246	.0246	.0245	.0212	.5580
.5804	.0315	.0317	.0314	.0281	.0316	.0331	.0282	.0281	.0281	.0265	.5804
.6027	.0315	.0317	.0314	.0281	.0316	.0348	.0300	.0299	.0299	.0283	.6027
.6250	.0333	.0334	.0332	.0299	.0316	.0366	.0318	.0317	.0316	.0301	.6250
.6473	.0333	.0334	.0332	.0316	.0334	.0366	.0318	.0317	.0316	.0301	.6473
.6696	.0333	.0334	.0350	.0316	.0334	.0366	.0318	.0317	.0316	.0301	.6696
.6920	.0351	.0334	.0350	.0316	.0334	.0366	.0318	.0317	.0316	.0301	.6920
.7143	.0351	.0334	.0350	.0316	.0334	.0366	.0318	.0317	.0316	.0301	.7143
.7366	.0351	.0334	.0350	.0316	.0334	.0366	.0318	.0317	.0316	.0301	.7366
.7589	.0351	.0352	.0350	.0334	.0352	.0366	.0318	.0317	.0316	.0301	.7589
.7813	.0351	.0352	.0350	.0316	.0352	.0366	.0318	.0335	.0316	.0301	.7813
.8036	.0351	.0352	.0350	.0316	.0352	.0366	.0318	.0317	.0334	.0301	.8036
.8259	.0405	.0370	.0404	.0370	.0370	.0402	.0354	.0353	.0370	.0373	.8259
.8482	.0708	.0656	.0707	.0656	.0638	.0651	.0586	.0603	.0674	.0713	.8482
.8705	.1083	.1049	.1081	.1031	.1013	.1025	.0962	.0996	.1049	.1106	.8705
.8929	.1368	.1335	.1348	.1316	.1298	.1310	.1248	.1282	.1316	.1357	.8929
.9152	.1493	.1477	.1473	.1441	.1441	.1452	.1409	.1425	.1441	.1464	.9152
.9375	.1529	.1531	.1527	.1495	.1495	.1505	.1462	.1478	.1495	.1500	.9375
.9598	.1546	.1549	.1544	.1513	.1530	.1523	.1480	.1496	.1513	.1518	.9598
.9821	.1564	.1549	.1544	.1513	.1530	.1523	.1480	.1514	.1513	.1518	.9821
1.0045	.1582	.1567	.1562	.1531	.1548	.1541	.1516	.1532	.1549	.1554	1.0045
1.0268	.1600	.1602	.1580	.1549	.1566	.1559	.1516	.1550	.1549	.1554	1.0268
1.0491	.1618	.1620	.1598	.1566	.1584	.1559	.1534	.1568	.1566	.1572	1.0491
1.0714	.1654	.1638	.1616	.1602	.1602	.1594	.1552	.1586	.1584	.1589	1.0714
1.0938	.1778	.1763	.1758	.1709	.1727	.1612	.1587	.1586	.1602	.1607	1.0938

TABLE XI.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 3.95$ - Continued

(b) $\alpha = 4°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.7355	1.7316	1.7317	1.7350	1.7386	1.7355	1.7316	1.7317	1.7350	1.7386	.0000
.0223	1.6465	1.6532	1.6605	1.6780	1.6994	1.7355	1.7316	1.7246	1.7136	1.6994	.0223
.0446	1.5040	1.5072	1.5216	1.5499	1.5819	1.6607	1.6532	1.6355	1.6139	1.5890	.0446
.0670	1.3081	1.3185	1.3400	1.3718	1.4146	1.5040	1.4966	1.4717	1.4395	1.4003	.0670
.0893	1.0624	1.0693	1.0907	1.1333	1.1796	1.3046	1.2936	1.2688	1.2330	1.1867	.0893
.1116	.8558	.8663	.8877	.9268	.9802	1.0873	1.0764	1.0444	1.0051	.9552	.1116
.1339	.6670	.6740	.6990	.7380	.7843	.8950	.8841	.8557	.8164	.7737	.1339
.1563	.4925	.4995	.5174	.5529	.5956	.6849	.6740	.6491	.6170	.5743	.1563
.1786	.3608	.3678	.3821	.4140	.4532	.5317	.5245	.4996	.4710	.4354	.1786
.2009	.2682	.2716	.2895	.3108	.3464	.4177	.4141	.3927	.3642	.3357	.2009
.2232	.1791	.1862	.1969	.2182	.2467	.3109	.3037	.2859	.2645	.2360	.2232
.2455	.1221	.1256	.1328	.1541	.1755	.2219	.2147	.2004	.1826	.1612	.2455
.2679	.0758	.0794	.0865	.1007	.1221	.1542	.1541	.1399	.1221	.1043	.2679
.2902	.0295	.0331	.0366	.0509	.0651	.0972	.0900	.0829	.0687	.0580	.2902
.3125	.0010	.0046	.0081	.0188	.0259	.0580	.0544	.0438	.0366	.0259	.3125
.3348	-.0061	-.0061	-.0025	.0473	.0224	.0509	.0473	.0402	.0295	.0188	.3348
.3571	-.0061	-.0061	-.0061	.0437	.0153						.3571
.3795	-.0059	-.0058	-.0005	.0084	.0173	.0460	.0442	.0354	.0230	.0139	.3795
.4018	-.0041	-.0058	-.0005	.0084	.0173	.0442	.0406	.0336	.0212	.0139	.4018
.4241	-.0041	-.0058	-.0005	.0049	.0138	.0424	.0406	.0318	.0212	.0121	.4241
.4464	.0012	-.0041	-.0005	.0049	.0138	.0406	.0388	.0300	.0194	.0103	.4464
.4688	.0066	.0013	-.0005	.0049	.0120	.0388	.0370	.0282	.0176	.0103	.4688
.4911	.0119	.0084	.0013	.0031	.0102	.0370	.0352	.0264	.0158	.0085	.4911
.5134	.0137	.0120	.0049	.0031	.0102	.0370	.0334	.0264	.0140	.0085	.5134
.5357	.0137	.0120	.0102	.0013	.0084	.0335	.0317	.0228	.0140	.0067	.5357
.5580	.0155	.0120	.0120	.0031	.0084	.0335	.0299	.0228	.0122	.0050	.5580
.5804	.0173	.0156	.0156	.0084	.0102	.0317	.0281	.0211	.0104	.0050	.5804
.6027	.0137	.0120	.0120	.0084	.0084	.0299	.0281	.0193	.0104	.0050	.6027
.6250	.0155	.0120	.0138	.0120	.0120	.0299	.0263	.0193	.0122	.0103	.6250
.6473	.0155	.0120	.0138	.0156	.0173	.0335	.0317	.0264	.0194	.0175	.6473
.6696	.0173	.0120	.0138	.0191	.0227	.0442	.0406	.0354	.0266	.0228	.6696
.6920	.0208	.0120	.0120	.0191	.0263	.0513	.0477	.0407	.0319	.0246	.6920
.7143	.0208	.0120	.0120	.0191	.0281	.0531	.0513	.0443	.0337	.0264	.7143
.7366	.0191	.0120	.0120	.0209	.0281	.0549	.0531	.0443	.0337	.0282	.7366
.7589	.0191	.0120	.0120	.0209	.0298	.0549	.0531	.0443	.0337	.0282	.7589
.7813	.0191	.0120	.0102	.0209	.0298	.0549	.0513	.0443	.0337	.0264	.7813
.8036	.0191	.0120	.0209	.0281	.0388	.1085	.1013	.0836	.0623	.0443	.8036
.8259	.0208	.0156	.0370	.0656	.0888	.1799	.1710	.1533	.1268	.0997	.8259
.8482	.0280	.0263	.0638	.1049	.1298	.2014	.1942	.1766	.1536	.1319	.8482
.8705	.0422	.0477	.0888	.1227	.1405	.2085	.2013	.1837	.1626	.1426	.8705
.8929	.0565	.0763	.1066	.1281	.1459	.2103	.2031	.1873	.1644	.1462	.8929
.9152	.0708	.0960	.1156	.1299	.1477	.2139	.2067	.1909	.1661	.1479	.9152
.9375	.0797	.1049	.1191	.1316	.1495	.2139	.2102	.1927	.1679	.1497	.9375
.9598	.0851	.1085	.1209	.1316	.1512	.2174	.2120	.1962	.1715	.1515	.9598
.9821	.0904	.1085	.1209	.1334	.1512	.2192	.2138	.1962	.1733	.1515	.9821
1.0045	.0958	.1102	.1209	.1334	.1530	.2246	.2174	.1998	.1751	.1551	1.0045
1.0268	.0976	.1120	.1227	.1352	.1548	.2282	.2227	.2034	.1787	.1569	1.0268
1.0491	.1011	.1120	.1227	.1352	.1566	.2299	.2245	.2070	.1805	.1569	1.0491
1.0714	.1029	.1120	.1245	.1370	.1584	.2353	.2281	.2105	.1840	.1587	1.0714
1.0938	.1172	.1263	.1370	.1495	.1709	.2353	.2281	.2105	.1840	.1587	1.0938

TABLE XI.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 3.95$ - Continued

(c) $\alpha = 8°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.6999	1.6995	1.7032	1.7101	1.7065	1.6999	1.6995	1.7032	1.7101	1.7065	.0000
.0223	1.5788	1.5856	1.6035	1.6353	1.6709	1.7462	1.7387	1.7246	1.7030	1.6709	.0223
.0446	1.4078	1.4182	1.4468	1.5000	1.5534	1.7070	1.6960	1.6605	1.6175	1.5605	.0446
.0670	1.2013	1.2188	1.2510	1.3184	1.3896	1.5859	1.5713	1.5180	1.4573	1.3789	.0670
.0893	.9448	.9589	1.0017	1.0727	1.1618	1.4150	1.3933	1.3400	1.2615	1.1724	.0893
.1116	.7383	.7523	.7987	.8698	.9624	1.2084	1.1868	1.1263	1.0087	.9481	.1116
.1339	.5566	.5743	.6135	.6490	.7737	1.0161	.9874	.9340	.8555	.7594	.1339
.1563	.3999	.4105	.4426	.5102	.5814	.7988	.7808	.7239	.6526	.5671	.1563
.1786	.2824	.2966	.3251	.3784	.4425	.6421	.6242	.5744	.5066	.4283	.1786
.2009	.2005	.2111	.2361	.2823	.3428	.5175	.5031	.4533	.3962	.3250	.2009
.2232	.1293	.1328	.1577	.1933	.2431	.3964	.3785	.3429	.2930	.2360	.2232
.2455	.0794	.0865	.0972	.1328	.1755	.2931	.2823	.2467	.2040	.1577	.2455
.2679	.0402	.0438	.0580	.0865	.1185	.2183	.2075	.1755	.1434	.1043	.2679
.2902	.0046	.0081	.0188	.0402	.0651	.1435	.1363	.1150	.0865	.0544	.2902
.3125	-.0203	-.0168	-.0097	.0081	.0295	.1043	.0936	.0687	.0473	.0259	.3125
.3348	-.0275	-.0203	-.0132	.0010	.0224	.0901	.0865	.0616	.0437	.0188	.3348
.3571	-.0275	-.0203	-.0132	-.0025	.0153						.3571
.3795	-.0201	-.0202	-.0148	-.0005	.0190	.0836	.0763	.0586	.0370	.0139	.3795
.4018	-.0130	-.0166	-.0148	-.0005	.0172	.0801	.0727	.0568	.0352	.0121	.4018
.4241	-.0076	-.0095	-.0148	-.0023	.0154	.0783	.0710	.0550	.0352	.0121	.4241
.4464	-.0058	-.0059	-.0130	-.0041	.0137	.0747	.0674	.0514	.0316	.0103	.4464
.4688	-.0058	-.0042	-.0094	-.0041	.0119	.0729	.0656	.0497	.0299	.0085	.4688
.4911	-.0041	-.0042	-.0076	-.0059	.0101	.0711	.0638	.0479	.0281	.0067	.4911
.5134	-.0041	-.0042	-.0059	-.0059	.0101	.0693	.0620	.0461	.0281	.0067	.5134
.5357	-.0041	-.0042	-.0059	-.0076	.0083	.0658	.0602	.0425	.0245	.0050	.5357
.5580	-.0041	-.0024	-.0041	-.0076	.0083	.0640	.0567	.0407	.0227	.0032	.5580
.5804	-.0005	-.0006	-.0005	-.0041	.0083	.0622	.0549	.0407	.0227	.0014	.5804
.6027	-.0041	-.0042	-.0041	-.0076	.0047	.0604	.0549	.0389	.0209	.0014	.6027
.6250	-.0041	-.0042	-.0041	-.0059	.0047	.0586	.0513	.0371	.0191	-.0004	.6250
.6473	-.0041	-.0042	-.0041	-.0023	.0047	.0568	.0513	.0354	.0191	.0014	.6473
.6696	-.0041	-.0042	-.0023	.0013	.0101	.0586	.0531	.0389	.0245	.0085	.6696
.6920	-.0041	-.0042	-.0005	.0049	.0172	.0711	.0656	.0532	.0352	.0157	.6920
.7143	-.0005	-.0042	-.0023	.0084	.0226	.0836	.0781	.0604	.0424	.0193	.7143
.7366	.0013	-.0042	-.0041	.0102	.0244	.0890	.0799	.0640	.0441	.0210	.7366
.7589	.0031	-.0059	-.0041	.0102	.0244	.0890	.0817	.0657	.0441	.0210	.7589
.7813	.0031	-.0077	-.0059	.0102	.0244	.0944	.0870	.0657	.0441	.0210	.7813
.8036	.0049	.0012	.0066	.0209	.0475	.2159	.1995	.1605	.1066	.0586	.8036
.8259	.0067	.0119	.0370	.0620	.1046	.2678	.2495	.2141	.1620	.1104	.8259
.8482	.0102	.0226	.0656	.0924	.1278	.2785	.2620	.2248	.1763	.1283	.8482
.8705	.0174	.0351	.0816	.1013	.1331	.2857	.2692	.2302	.1816	.1319	.8705
.8929	.0263	.0494	.0852	.1031	.1349	.2928	.2745	.2356	.1852	.1336	.8929
.9152	.0352	.0619	.0852	.1031	.1367	.2982	.2799	.2391	.1870	.1354	.9152
.9375	.0424	.0708	.0852	.1031	.1385	.3036	.2853	.2445	.1888	.1372	.9375
.9598	.0477	.0761	.0834	.1049	.1403	.3107	.2924	.2499	.1924	.1390	.9598
.9821	.0531	.0779	.0834	.1049	.1421	.3143	.2960	.2534	.1941	.1390	.9821
1.0045	.0567	.0797	.0834	.1049	.1438	.3214	.3031	.2588	.2013	.1426	1.0045
1.0268	.0602	.0797	.0834	.1066	.1474	.3286	.3085	.2642	.2031	.1444	1.0268
1.0491	.0620	.0797	.0834	.1066	.1474	.3304	.3103	.2677	.2049	.1462	1.0491
1.0714	.0638	.0797	.0834	.1084	.1510	.3375	.3174	.2713	.2102	.1497	1.0714
1.0938	.0799	.0922	.0977	.1209	.1652	.3375	.3156	.2695	.2102	.1515	1.0938

TABLE XI.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 3.95 - Concluded

(d) α = 12°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.6464	1.6534	1.6606	1.6640	1.6678	1.6464	1.6534	1.6606	1.6640	1.6678	.0000
.0223	1.4932	1.5109	1.5360	1.5821	1.6287	1.7318	1.7281	1.7069	1.6783	1.6322	.0223
.0446	1.3009	1.3222	1.3650	1.4361	1.5183	1.7318	1.7175	1.6713	1.5999	1.5218	.0446
.0670	1.0837	1.1085	1.1656	1.2545	1.3580	1.6464	1.6213	1.5573	1.4611	1.3473	.0670
.0893	.8273	.8486	.9092	1.0052	1.1300	1.5039	1.4789	1.3971	1.2794	1.1479	.0893
.1116	.6207	.6456	.7062	.8058	.9448	1.3223	1.2901	1.2012	1.0729	.9270	.1116
.1339	.4533	.4746	.5352	.6278	.7561	1.1300	1.0943	1.0053	.8806	.7454	.1339
.1563	.3144	.3322	.3892	.4640	.5709	.9198	.8877	.7988	.6812	.5602	.1563
.1786	.2111	.2289	.2717	.3393	.4355	.7560	.7275	.6456	.5352	.4249	.1786
.2009	.1399	.1577	.1898	.2539	.3358	.6243	.5957	.5210	.4212	.3216	.2009
.2232	.0794	.0901	.1186	.1648	.2397	.4889	.4640	.3999	.3144	.2325	.2232
.2455	.0402	.4034	.0723	.1150	.1684	.3750	.3536	.3002	.2289	.1577	.2455
.2679	.0082	.3749	.0331	.0687	.1186	.2895	.2717	.2254	.1613	.1043	.2679
.2902	-.0168	.3429	.0010	.0260	.0651	.2040	.1898	.1470	.0972	.0509	.2902
.3125	-.0381	.3251	-.0239	.0010	.0260	.1506	.1363	.1043	.0616	.0260	.3125
.3348	-.0381	.3215	-.0310	-.0097	.0224	.1399	.1257	.0972	.0544	.0224	.3348
.3571	-.0275	.3251	-.0310	-.0132	.0188						.3571
.3795	-.0201	-.0220	-.0255	-.0094	.0173	.1335	.1174	.0872	.0479	.0139	.3795
.4018	-.0183	-.0184	-.0237	-.0112	.0155	.1281	.1138	.0836	.0461	.0121	.4018
.4241	-.0183	-.0184	-.0237	-.0112	.0138	.1245	.1102	.0818	.0443	.0103	.4241
.4464	-.0166	-.0166	-.0219	-.0130	.0120	.1210	.1066	.0783	.0407	.0085	.4464
.4688	-.0166	-.0166	-.0201	-.0148	.0102	.1192	.1049	.0765	.0389	.0085	.4688
.4911	-.0166	-.0166	-.0184	-.0166	.0084	.1156	.1013	.0729	.0371	.0049	.4911
.5134	-.0166	-.0166	-.0184	-.0166	.0066	.1138	.0995	.0711	.0353	.0032	.5134
.5357	-.0166	-.0166	-.0184	-.0184	.0048	.1102	.0959	.0693	.0318	.0014	.5357
.5580	-.0166	-.0166	-.0184	-.0184	.0031	.1085	.0941	.0675	.0300	-.0004	.5580
.5804	-.0148	-.0131	-.0148	-.0166	.0048	.1067	.0924	.0640	.0282	-.0022	.5804
.6027	-.0183	-.0166	-.0184	-.0219	-.0005	.1049	.0906	.0622	.0264	-.0040	.6027
.6250	-.0183	-.0166	-.0166	-.0219	-.0023	.1031	.0888	.0604	.0246	-.0040	.6250
.6473	-.0183	-.0166	-.0166	-.0219	-.0023	.1013	.0870	.0586	.0228	-.0058	.6473
.6696	-.0201	-.0184	-.0166	-.0184	-.0023	.0995	.0870	.0586	.0228	-.0040	.6696
.6920	-.0201	-.0184	-.0166	-.0130	.0048	.1049	.0924	.0675	.0336	.0032	.6920
.7143	-.0183	-.0184	-.0148	-.0094	.0120	.1263	.1120	.0836	.0443	.0103	.7143
.7366	-.0148	-.0166	-.0166	-.0076	.0155	.1370	.1209	.0908	.0496	.0139	.7366
.7589	-.0076	-.0166	-.0166	-.0076	.0173	.1388	.1245	.0926	.0514	.0157	.7589
.7813	-.0058	-.0166	-.0166	-.0076	.0173	.1602	.1406	.0997	.0514	.0139	.7813
.8036	-.0041	-.0166	-.0094	.0048	.0459	.3353	.3031	.2320	.1372	.0586	.8036
.8259	-.0005	-.0006	.0174	.0406	.0994	.3745	.3388	.2695	.1819	.1032	.8259
.8482	.0013	.0083	.0406	.0620	.1155	.3870	.3531	.2803	.1908	.1140	.8482
.8705	.0049	.0172	.0513	.0673	.1173	.3995	.3656	.2910	.1962	.1175	.8705
.8929	.0084	.0279	.0531	.0691	.1209	.4103	.3745	.2981	.2016	.1193	.8929
.9152	.0138	.0386	.0531	.0691	.1227	.4210	.3852	.3053	.2051	.1211	.9152
.9375	.0192	.0476	.0531	.0691	.1244	.4299	.3923	.3106	.2087	.1211	.9375
.9598	.0245	.0529	.0513	.0691	.1262	.4388	.4031	.3196	.2159	.1265	.9598
.9821	.0299	.0547	.0495	.0691	.1298	.4460	.4084	.3249	.2177	.1265	.9821
1.0045	.0334	.0547	.0495	.0691	.1316	.4567	.4173	.3339	.2248	.1300	1.0045
1.0268	.0370	.0547	.0477	.0709	.1351	.4638	.4263	.3375	.2284	.1336	1.0268
1.0491	.0388	.0529	.0477	.0709	.1387	.4728	.4334	.3428	.2302	.1354	1.0491
1.0714	.0406	.0529	.0477	.0745	.1423	.4835	.4423	.3500	.2355	.1390	1.0714
1.0938	.0549	.0654	.0620	.0888	.1530	.4799	.4370	.3482	.2355	.1390	1.0938

TABLE XII.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 4.63$

(a) $\alpha = 0°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.7589	1.7610	1.7595	1.7592	1.7591	1.7589	1.7610	1.7595	1.7592	1.7591	.0000
.0223	1.7133	1.7154	1.7140	1.7137	1.7136	1.7179	1.7200	1.7195	1.7228	1.7181	.0223
.0446	1.5904	1.5969	1.5956	1.5953	1.5998	1.6086	1.6106	1.6092	1.6044	1.6089	.0446
.0670	1.4174	1.4192	1.4180	1.4223	1.4268	1.4220	1.4238	1.4225	1.4177	1.4131	.0670
.0893	1.1762	1.1822	1.1811	1.1855	1.1900	1.1944	1.2004	1.1994	1.1946	1.1945	.0893
.1116	.9668	.9680	.9717	.9715	.9760	.9576	.9680	.9626	.9579	.9532	.1116
.1339	.7710	.7765	.7758	.7803	.7848	.7801	.7811	.7758	.7712	.7666	.1339
.1563	.5844	.5851	.5846	.5890	.5935	.5844	.5806	.5800	.5754	.5753	.1563
.1786	.4432	.4438	.4434	.4479	.4524	.4432	.4393	.4389	.4342	.4342	.1786
.2009	.3385	.3390	.3387	.3432	.3477	.3340	.3390	.3341	.3341	.3340	.2009
.2232	.2429	.2433	.2430	.2430	.2475	.2384	.2433	.2430	.2384	.2384	.2232
.2455	.1746	.1749	.1747	.1747	.1792	.1655	.1658	.1656	.1610	.1610	.2455
.2679	.1200	.1202	.1246	.1246	.1246	.1155	.1111	.1110	.1064	.1109	.2679
.2902	.0699	.0747	.0745	.0745	.0745	.0654	.0655	.0654	.0609	.0654	.2902
.3125	.0335	.0336	.0381	.0381	.0381	.0335	.0336	.0335	.0335	.0335	.3125
.3348	.0290	.0291	.0290	.0290	.0290	.0290	.0291	.0290	.0290	.0290	.3348
.3571	.0244	.0245	.0244	.0244	.0244						.3571
.3795	.0266	.0266	.0265	.0265	.0265	.0241	.0240	.0239	.0196	.0218	.3795
.4018	.0244	.0266	.0265	.0265	.0265	.0218	.0217	.0239	.0174	.0195	.4018
.4241	.0221	.0243	.0243	.0243	.0265	.0218	.0195	.0216	.0174	.0195	.4241
.4464	.0221	.0220	.0220	.0243	.0243	.0195	.0195	.0193	.0151	.0173	.4464
.4688	.0198	.0198	.0220	.0220	.0220	.0173	.0172	.0193	.0128	.0150	.4688
.4911	.0198	.0198	.0197	.0220	.0220	.0150	.0149	.0171	.0128	.0150	.4911
.5134	.0221	.0220	.0220	.0220	.0220	.0173	.0172	.0193	.0128	.0173	.5134
.5357	.0289	.0289	.0265	.0265	.0265	.0218	.0217	.0239	.0196	.0241	.5357
.5580	.0357	.0357	.0334	.0334	.0333	.0286	.0285	.0307	.0264	.0309	.5580
.5804	.0403	.0425	.0402	.0402	.0402	.0331	.0331	.0352	.0310	.0331	.5804
.6027	.0380	.0402	.0402	.0402	.0402	.0354	.0353	.0374	.0332	.0354	.6027
.6250	.0403	.0402	.0402	.0402	.0402	.0354	.0353	.0374	.0332	.0354	.6250
.6473	.0403	.0402	.0402	.0402	.0402	.0354	.0376	.0374	.0355	.0354	.6473
.6696	.0403	.0402	.0402	.0402	.0402	.0377	.0376	.0397	.0355	.0354	.6696
.6920	.0403	.0402	.0402	.0424	.0424	.0377	.0376	.0397	.0355	.0377	.6920
.7143	.0403	.0402	.0402	.0424	.0424	.0377	.0376	.0397	.0355	.0354	.7143
.7366	.0403	.0402	.0402	.0424	.0424	.0377	.0376	.0397	.0355	.0377	.7366
.7589	.0403	.0402	.0402	.0424	.0424	.0377	.0376	.0397	.0355	.0354	.7589
.7813	.0403	.0425	.0402	.0424	.0424	.0377	.0376	.0397	.0355	.0377	.7813
.8036	.0403	.0425	.0402	.0424	.0424	.0377	.0376	.0397	.0355	.0377	.8036
.8259	.0403	.0425	.0402	.0424	.0424	.0377	.0376	.0397	.0355	.0377	.8259
.8482	.0426	.0448	.0470	.0470	.0493	.0445	.0444	.0465	.0423	.0445	.8482
.8705	.0517	.0539	.0606	.0629	.0652	.0649	.0648	.0646	.0628	.0649	.8705
.8929	.0721	.0743	.0811	.0856	.0902	.0898	.0875	.0917	.0877	.0875	.8929
.9152	.0904	.0948	.0993	.1061	.1083	.1057	.1056	.1076	.1036	.1057	.9152
.9375	.1063	.1084	.1129	.1174	.1197	.1170	.1169	.1189	.1150	.1170	.9375
.9598	.1177	.1175	.1197	.1243	.1265	.1238	.1237	.1257	.1241	.1238	.9598
.9821	.1222	.1221	.1243	.1288	.1311	.1284	.1282	.1279	.1263	.1284	.9821
1.0045	.1245	.1266	.1288	.1311	.1333	.1306	.1305	.1325	.1309	.1306	1.0045
1.0268	.1290	.1289	.1288	.1334	.1356	.1329	.1328	.1347	.1309	.1352	1.0268
1.0491	.1290	.1312	.1311	.1334	.1379	.1352	.1350	.1370	.1331	.1352	1.0491
1.0714	.1313	.1312	.1334	.1379	.1379	.1374	.1373	.1393	.1354	.1374	1.0714
1.0938	.1518	.1539	.1538	.1561	.1583	.1443	.1441	.1460	.1422	.1442	1.0938

TABLE XII.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 4.63 - Continued

(b) α = 4°

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.7407	1.7476	1.7479	1.7501	1.7522	1.7407	1.7476	1.7479	1.7501	1.7522	.0000
.0223	1.6496	1.6610	1.6704	1.6864	1.7066	1.7452	1.7522	1.7433	1.7319	1.7157	.0223
.0446	1.4994	1.5151	1.5245	1.5589	1.5926	1.6769	1.6701	1.6567	1.6318	1.6017	.0446
.0670	1.3036	1.3191	1.3375	1.3768	1.4194	1.5176	1.5151	1.4880	1.4542	1.4103	.0670
.0893	1.0578	1.0684	1.0868	1.1309	1.1824	1.3173	1.3100	1.2874	1.2402	1.1915	.0893
.1116	.8393	.8496	.8725	.9214	.9544	1.0942	1.0821	1.0549	1.0079	.9499	.1116
.1339	.6526	.6627	.6856	.7256	.7812	.8985	.8952	.8588	.8213	.7630	.1339
.1563	.4751	.4895	.5078	.5435	.5898	.6936	.6855	.6537	.6164	.5715	.1563
.1786	.3522	.3664	.3801	.4115	.4485	.5388	.5305	.5078	.4707	.4302	.1786
.2009	.2611	.2707	.2844	.3113	.3436	.4205	.4211	.3938	.3659	.3299	.2009
.2232	.1746	.1886	.1932	.2202	.2433	.3158	.3071	.2890	.2658	.2342	.2232
.2455	.1246	.1248	.1385	.1565	.1795	.2247	.2251	.2069	.1929	.1567	.2455
.2679	.0790	.0792	.0884	.1064	.1203	.1701	.1567	.1476	.1292	.1066	.2679
.2902	.0335	.0382	.0428	.0609	.0701	.1018	.1020	.0884	.0791	.0610	.2902
.3125	.0107	.0109	.0154	.0244	.0336	.0699	.0656	.0565	.0472	.0291	.3125
.3348	.0016	.0017	.0109	.0199	.0291	.0563	.0564	.0519	.0426	.0245	.3348
.3571	-.0029	.0017	.0063	.0153	.0245						.3571
.3795	.0038	.0061	.0106	.0174	.0265	.0535	.0489	.0444	.0353	.0218	.3795
.4018	.0038	.0039	.0084	.0174	.0265	.0513	.0467	.0421	.0330	.0195	.4018
.4241	.0038	.0039	.0084	.0152	.0243	.0490	.0444	.0398	.0308	.0173	.4241
.4464	.0084	.0061	.0084	.0129	.0243	.0445	.0421	.0376	.0285	.0173	.4464
.4688	.0152	.0129	.0084	.0129	.0220	.0445	.0399	.0353	.0262	.0150	.4688
.4911	.0197	.0175	.0106	.0129	.0197	.0422	.0376	.0353	.0240	.0150	.4911
.5134	.0220	.0198	.0152	.0129	.0197	.0399	.0353	.0330	.0240	.0127	.5134
.5357	.0220	.0198	.0175	.0129	.0174	.0377	.0353	.0308	.0217	.0104	.5357
.5580	.0243	.0220	.0197	.0129	.0174	.0354	.0331	.0285	.0194	.0104	.5580
.5804	.0265	.0266	.0266	.0197	.0220	.0331	.0308	.0262	.0194	.0104	.5804
.6027	.0243	.0220	.0220	.0174	.0174	.0331	.0308	.0262	.0194	.0104	.6027
.6250	.0243	.0220	.0220	.0197	.0197	.0309	.0285	.0262	.0194	.0150	.6250
.6473	.0243	.0220	.0220	.0220	.0243	.0354	.0331	.0308	.0262	.0195	.6473
.6696	.0243	.0198	.0220	.0243	.0288	.0445	.0444	.0398	.0330	.0241	.6696
.6920	.0265	.0220	.0220	.0265	.0333	.0513	.0489	.0466	.0376	.0263	.6920
.7143	.0265	.0220	.0220	.0265	.0356	.0558	.0512	.0499	.0398	.0286	.7143
.7366	.0265	.0220	.0197	.0243	.0356	.0558	.0535	.0489	.0398	.0309	.7366
.7589	.0265	.0220	.0197	.0265	.0356	.0558	.0512	.0489	.0398	.0309	.7589
.7813	.0265	.0220	.0197	.0243	.0356	.0558	.0512	.0466	.0398	.0286	.7813
.8036	.0265	.0220	.0220	.0288	.0402	.0830	.0807	.0693	.0534	.0377	.8036
.8259	.0265	.0243	.0311	.0515	.0720	.1443	.1396	.1259	.1010	.0739	.8259
.8482	.0265	.0243	.0425	.0811	.1061	.1715	.1668	.1531	.1304	.1057	.8482
.8705	.0265	.0266	.0584	.0993	.1220	.1805	.1759	.1622	.1418	.1193	.8705
.8929	.0288	.0311	.0720	.1084	.1288	.1851	.1804	.1667	.1463	.1238	.8929
.9152	.0356	.0402	.0834	.1106	.1288	.1873	.1827	.1690	.1485	.1261	.9152
.9375	.0424	.0539	.0902	.1129	.1311	.1919	.1849	.1712	.1508	.1284	.9375
.9598	.0538	.0675	.0947	.1129	.1311	.1941	.1872	.1735	.1508	.1284	.9598
.9821	.0606	.0766	.0947	.1129	.1311	.1987	.1895	.1735	.1531	.1284	.9821
1.0045	.0652	.0834	.0970	.1129	.1333	.2032	.1940	.1780	.1553	.1306	1.0045
1.0268	.0697	.0857	.0993	.1129	.1356	.2055	.1985	.1826	.1576	.1329	1.0268
1.0491	.0743	.0880	.0993	.1152	.1356	.2100	.2031	.1848	.1599	.1329	1.0491
1.0714	.0765	.0880	.0993	.1152	.1379	.2168	.2076	.1894	.1621	.1352	1.0714
1.0938	.0993	.1107	.1175	.1334	.1561	.2214	.2121	.1916	.1667	.1374	1.0938

TABLE XII.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT $M_\infty = 4.63$ - Continued

(c) $\alpha = 8°$

Orifice station, s/l	C_p at meridian angle, θ, deg = 90	67.5	45	22.5	0	270	247.5	225	202.5	180	Orifice station, s/l
.0000	1.7112	1.7136	1.7159	1.7183	1.7228	1.7112	1.7136	1.7159	1.7183	1.7228	.0000
.0223	1.5839	1.5952	1.6111	1.6409	1.6818	1.7522	1.7591	1.7433	1.7183	1.6909	.0223
.0446	1.4020	1.4222	1.4470	1.4952	1.5680	1.7203	1.7136	1.6795	1.6272	1.5771	.0446
.0670	1.1929	1.2128	1.2509	1.3130	1.3995	1.5976	1.5861	1.5381	1.4633	1.3904	.0670
.0893	.9428	.9578	.9956	1.0671	1.1628	1.4248	1.4131	1.3512	1.2675	1.1719	.0893
.1116	.7200	.7438	.7859	.8577	.9624	1.2202	1.2037	1.1369	1.0444	.9442	.1116
.1339	.5472	.5617	.6035	.6710	.7666	1.0246	1.0079	.9409	.8531	.7575	.1339
.1563	.3881	.4023	.4394	.4980	.5799	.8109	.7939	.7312	.6482	.5663	.1563
.1786	.2744	.2930	.3209	.3705	.4433	.6472	.6300	.5762	.2749	.4297	.1786
.2009	.1971	.2111	.2343	.2749	.3432	.5245	.5116	.4576	.3932	.3295	.2009
.2232	.1289	.1382	.1568	.1929	.2430	.4017	.3887	.3437	.2840	.2384	.2232
.2455	.0834	.0927	.1020	.1292	.1747	.3017	.2885	.2525	.2066	.1610	.2455
.2679	.0470	.0563	.0656	.0882	.1246	.2289	.2156	.1841	.1474	.1109	.2679
.2902	.0152	.0199	.0245	.0426	.0745	.1516	.1519	.1203	.0882	.0654	.2902
.3125	-.0075	-.0029	.0017	.0108	.0381	.1061	.1064	.0792	.0563	.0335	.3125
.3348	-.0121	-.0120	-.0028	.0017	.0290	.0971	.0973	.0701	.0472	.0290	.3348
.3571	-.0166	-.0120	-.0074	.0017	.0244						.3571
.3795	-.0076	-.0098	-.0007	.0084	.0288	.0898	.0808	.0649	.0466	.0218	.3795
.4018	-.0030	-.0075	-.0007	.0084	.0265	.0876	.0763	.0626	.0421	.0195	.4018
.4241	.0038	-.0007	-.0030	.0084	.0243	.0830	.0740	.0603	.0398	.0173	.4241
.4464	.0061	.0039	-.0007	.0062	.0243	.0785	.0695	.0581	.0375	.0150	.4464
.4688	.0061	.0039	.0015	.0039	.0220	.0762	.0672	.0535	.0353	.0150	.4688
.4911	.0084	.0061	.0038	.0039	.0197	.0740	.0650	.0513	.0330	.0127	.4911
.5134	.0084	.0061	.0038	.0039	.0174	.0717	.0627	.0513	.0330	.0104	.5134
.5357	.0084	.0084	.0061	.0016	.0174	.0694	.0604	.0467	.0307	.0104	.5357
.5580	.0084	.0084	.0084	.0016	.0152	.0672	.0582	.0445	.0285	.0082	.5580
.5804	.0129	.0129	.0129	.0084	.0197	.0649	.0559	.0445	.0262	.0082	.5804
.6027	.0084	.0061	.0084	.0016	.0129	.0626	.0536	.0422	.0240	.0059	.6027
.6250	.0084	.0084	.0084	.0039	.0129	.0603	.0513	.0399	.0240	.0059	.6250
.6473	.0084	.0084	.0084	.0062	.0129	.0603	.0513	.0399	.0240	.0059	.6473
.6696	.0084	.0084	.0084	.0084	.0174	.0603	.0536	.0422	.0262	.0127	.6696
.6920	.0084	.0061	.0084	.0130	.0243	.0740	.0650	.0535	.0375	.0173	.6920
.7143	.0084	.0061	.0084	.0153	.0265	.0853	.0763	.0626	.0421	.0218	.7143
.7366	.0106	.0084	.0084	.0153	.0311	.0876	.0786	.0649	.0466	.0241	.7366
.7589	.0129	.0061	.0061	.0153	.0311	.0876	.0808	.0672	.0466	.0241	.7589
.7813	.0152	.0061	.0038	.0153	.0311	.0921	.0808	.0649	.0443	.0241	.7813
.8036	.0152	.0061	.0038	.0221	.0424	.1805	.1625	.1284	.0851	.0445	.8036
.8259	.0152	.0061	.0243	.0494	.0833	.2372	.2215	.1851	.1372	.0853	.8259
.8482	.0152	.0084	.0402	.0744	.1083	.2531	.2351	.2009	.1553	.1057	.8482
.8705	.0152	.0129	.0538	.0858	.1174	.2622	.2442	.2077	.1598	.1147	.8705
.8929	.0174	.0198	.0652	.0881	.1197	.2690	.2487	.2123	.1621	.1170	.8929
.9152	.0197	.0266	.0720	.0903	.1220	.2735	.2555	.2168	.1644	.1170	.9152
.9375	.0220	.0357	.0720	.0903	.1220	.2826	.2624	.2214	.1689	.1193	.9375
.9598	.0265	.0425	.0720	.0903	.1220	.2917	.2692	.2259	.1712	.1193	.9598
.9821	.0311	.0493	.0720	.0903	.1242	.2985	.2760	.2304	.1734	.1215	.9821
1.0045	.0356	.0539	.0720	.0903	.1265	.3075	.2850	.2372	.1780	.1238	1.0045
1.0268	.0379	.0584	.0697	.0903	.1265	.3143	.2918	.2418	.1825	.1238	1.0268
1.0491	.0402	.0584	.0697	.0903	.1288	.3189	.2964	.2486	.1870	.1261	1.0491
1.0714	.0447	.0607	.0697	.0903	.1311	.3279	.3032	.2531	.1916	.1284	1.0714
1.0938	.0674	.0834	.0856	.1085	.1515	.3302	.3055	.2554	.1938	.1306	1.0938

TABLE XII.- SURFACE-PRESSURE COEFFICIENTS FOR MODEL 2 AT M_∞ = 4.63 - Concluded

(d) α = 12°

Orifice station, s/l	C_p at meridian angle, θ, deg =										Orifice station, s/l
	90	67.5	45	22.5	0	270	247.5	225	202.5	180	
.0000	1.6540	1.6561	1.6639	1.6701	1.6729	1.6540	1.6561	1.6639	1.6701	1.6729	.0000
.0223	1.4947	1.5057	1.5364	1.5835	1.6319	1.7451	1.7381	1.7140	1.6838	1.6410	.0223
.0446	1.2990	1.3097	1.3633	1.4331	1.5226	1.7451	1.7290	1.6821	1.6063	1.5271	.0446
.0670	1.0805	1.0955	1.1538	1.2462	1.3587	1.6631	1.6378	1.5728	1.4650	1.3495	.0670
.0893	.8256	.8403	.9034	1.0000	1.1310	1.5220	1.4920	1.4088	1.2826	1.1492	.0893
.1116	.6162	.6352	.6984	.8040	.9397	1.3354	1.3006	1.2085	1.0730	.9261	.1116
.1339	.4477	.4620	.5254	.6217	.7530	1.1397	1.1046	1.0127	.8769	.7439	.1339
.1563	.3112	.3207	.3751	.4530	.5709	.9257	.8950	.8032	.6764	.5527	.1563
.1786	.2156	.2250	.2658	.3345	.4388	.7664	.7309	.6483	.5351	.4206	.1786
.2009	.1428	.1521	.1884	.2433	.3386	.6298	.5987	.5208	.4166	.3204	.2009
.2232	.0881	.0929	.1201	.1704	.2430	.4933	.4666	.3979	.3117	.2339	.2232
.2455	.0472	.0564	.0745	.1157	.1793	.3795	.3526	.2977	.2297	.1610	.2455
.2679	.0244	.0200	.0427	.0747	.1246	.2930	.2752	.2248	.1658	.1110	.2679
.2902	-.0029	-.0074	.0108	.0336	.0745	.2156	.1931	.1565	.1020	.0654	.2902
.3125	-.0211	-.0256	-.0120	.0063	.0381	.1564	.1476	.1110	.0701	.0335	.3125
.3348	-.0211	-.0256	-.0165	.0017	.0335	.1428	.1339	.1019	.0610	.0290	.3348
.3571	-.0166	-.0256	-.0211	-.0028	.0290						.3571
.3795	-.0076	-.0099	-.0121	.0016	.0288	.1352	.1215	.0921	.0558	.0218	.3795
.4018	-.0076	-.0076	-.0098	.0016	.0265	.1306	.1169	.0876	.0513	.0195	.4018
.4241	-.0053	-.0076	-.0098	-.0007	.0243	.1261	.1147	.0853	.0490	.0173	.4241
.4464	-.0053	-.0053	-.0075	-.0029	.0220	.1216	.1101	.0808	.0467	.0150	.4464
.4688	-.0053	-.0053	-.0075	-.0052	.0197	.1170	.1056	.0785	.0445	.0150	.4688
.4911	-.0053	-.0053	-.0075	-.0052	.0174	.1148	.1033	.0762	.0422	.0104	.4911
.5134	-.0053	-.0053	-.0053	-.0075	.0174	.1125	.1011	.0740	.0399	.0104	.5134
.5357	-.0053	-.0053	-.0053	-.0075	.0152	.1080	.0965	.0694	.0377	.0082	.5357
.5580	-.0053	-.0053	-.0053	-.0075	.0152	.1057	.0943	.0672	.0354	.0059	.5580
.5804	.0015	.0015	.0016	-.0052	.0174	.1034	.0920	.0649	.0309	.0036	.5804
.6027	-.0053	-.0053	-.0053	-.0098	.0083	.1012	.0897	.0649	.0309	.0036	.6027
.6250	-.0053	-.0053	-.0053	-.0098	.0083	.0989	.0897	.0626	.0286	.0014	.6250
.6473	-.0053	-.0053	-.0053	-.0098	.0083	.0989	.0875	.0604	.0263	-.0009	.6473
.6696	-.0053	-.0053	-.0053	-.0075	.0083	.0966	.0875	.0604	.0263	.0014	.6696
.6920	-.0053	-.0053	-.0053	-.0029	.0152	.1034	.0920	.0672	.0354	.0082	.6920
.7143	-.0053	-.0053	-.0053	-.0007	.0197	.1238	.1124	.0830	.0445	.0150	.7143
.7366	-.0053	-.0053	-.0053	.0016	.0243	.1329	.1215	.0898	.0513	.0173	.7366
.7589	-.0030	-.0053	-.0053	.0016	.0265	.1352	.1215	.0921	.0535	.0195	.7589
.7813	-.0007	-.0053	-.0075	.0016	.0265	.1465	.1283	.0944	.0513	.0173	.7813
.8036	.0015	-.0053	-.0075	.0084	.0424	.2917	.2643	.1919	.1102	.0445	.8036
.8259	.0038	.0038	.0061	.0312	.0833	.3415	.3118	.2418	.1578	.0830	.8259
.8482	.0038	.0015	.0266	.0494	.1038	.3574	.3277	.2554	.1714	.0989	.8482
.8705	.0038	.0038	.0402	.0585	.1083	.3733	.3413	.2645	.1782	.1034	.8705
.8929	.0061	.0083	.0447	.0608	.1106	.3869	.3526	.2736	.1805	.1057	.8929
.9152	.0084	.0129	.0470	.0608	.1129	.4005	.3640	.2826	.1850	.1079	.9152
.9375	.0106	.0174	.0447	.0608	.1152	.4141	.3776	.2917	.1896	.1079	.9375
.9598	.0129	.0242	.0425	.0608	.1152	.4300	.3912	.3008	.1964	.1102	.9598
.9821	.0152	.0310	.0425	.0608	.1174	.4390	.3980	.3076	.2009	.1125	.9821
1.0045	.0174	.0356	.0425	.0630	.1174	.4527	.4116	.3189	.2077	.1125	1.0045
1.0268	.0197	.0378	.0402	.0608	.1220	.4640	.4229	.3257	.2122	.1147	1.0268
1.0491	.0243	.0401	.0402	.0630	.1242	.4753	.4342	.3325	.2168	.1193	1.0491
1.0714	.0265	.0401	.0402	.0630	.1265	.4889	.4456	.3439	.2236	.1215	1.0714
1.0938	.0493	.0628	.0606	.0835	.1470	.4889	.4478	.3461	.2258	.1261	1.0938

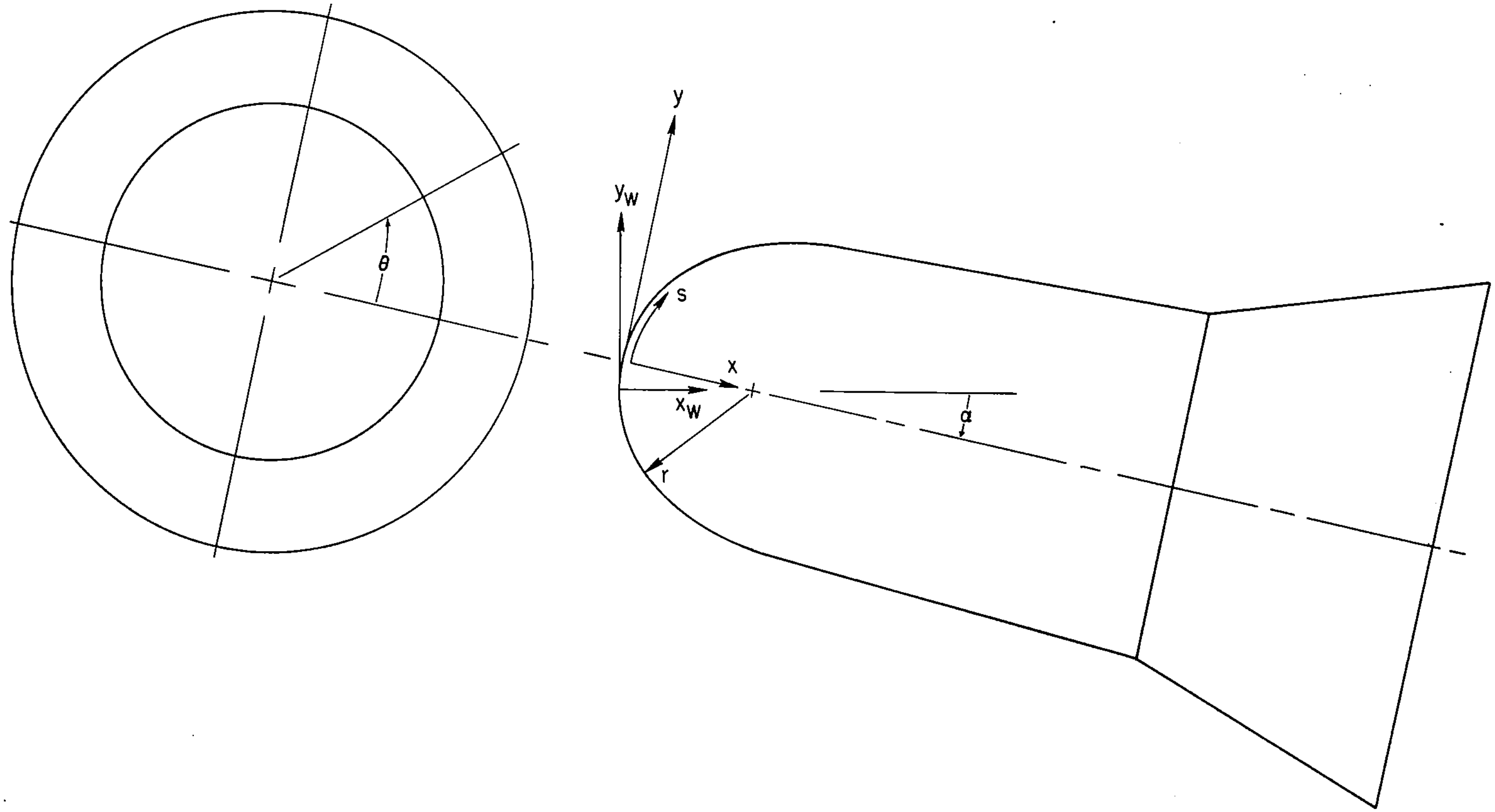


Figure 1.- Axis systems.

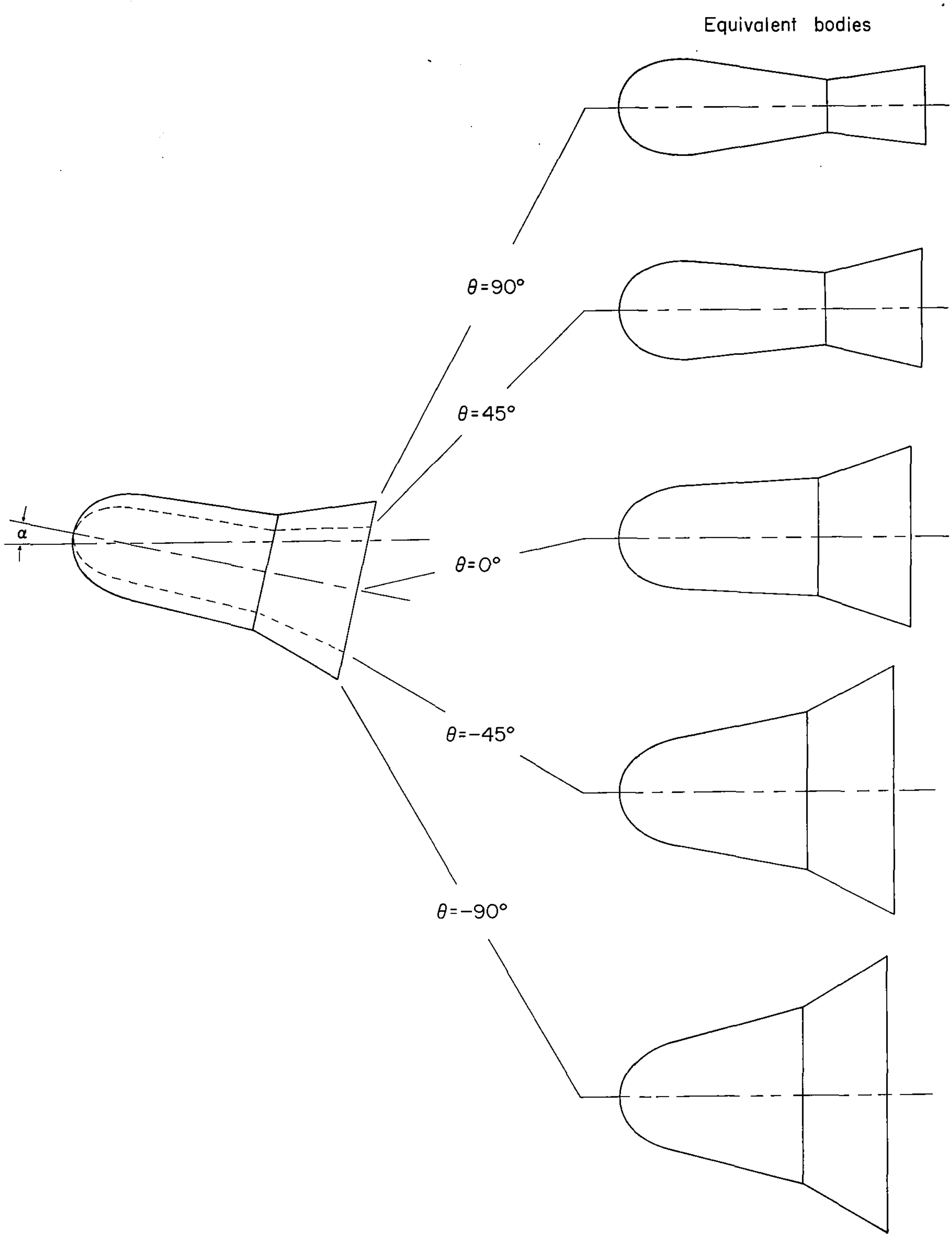
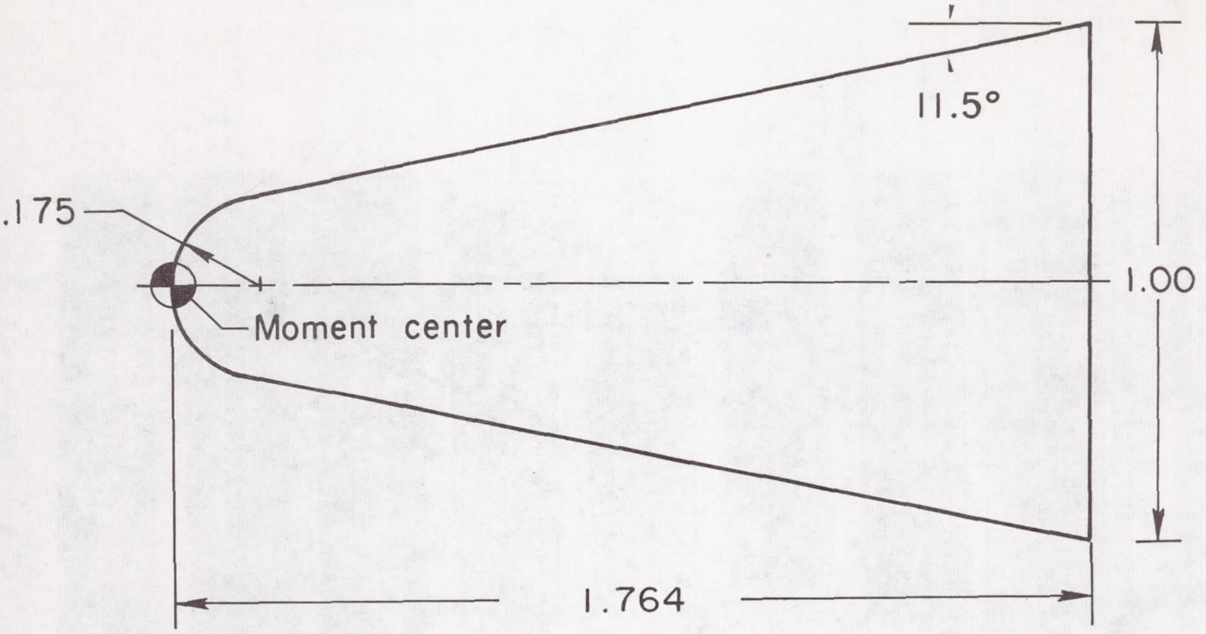
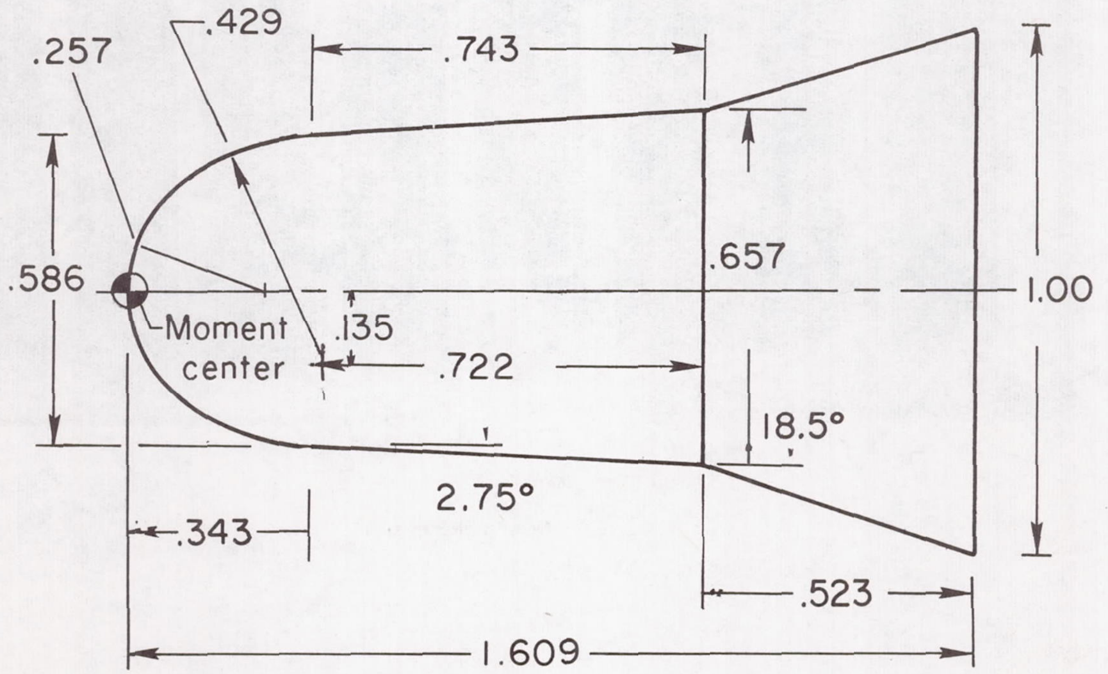


Figure 2.- Typical equivalent body shapes.

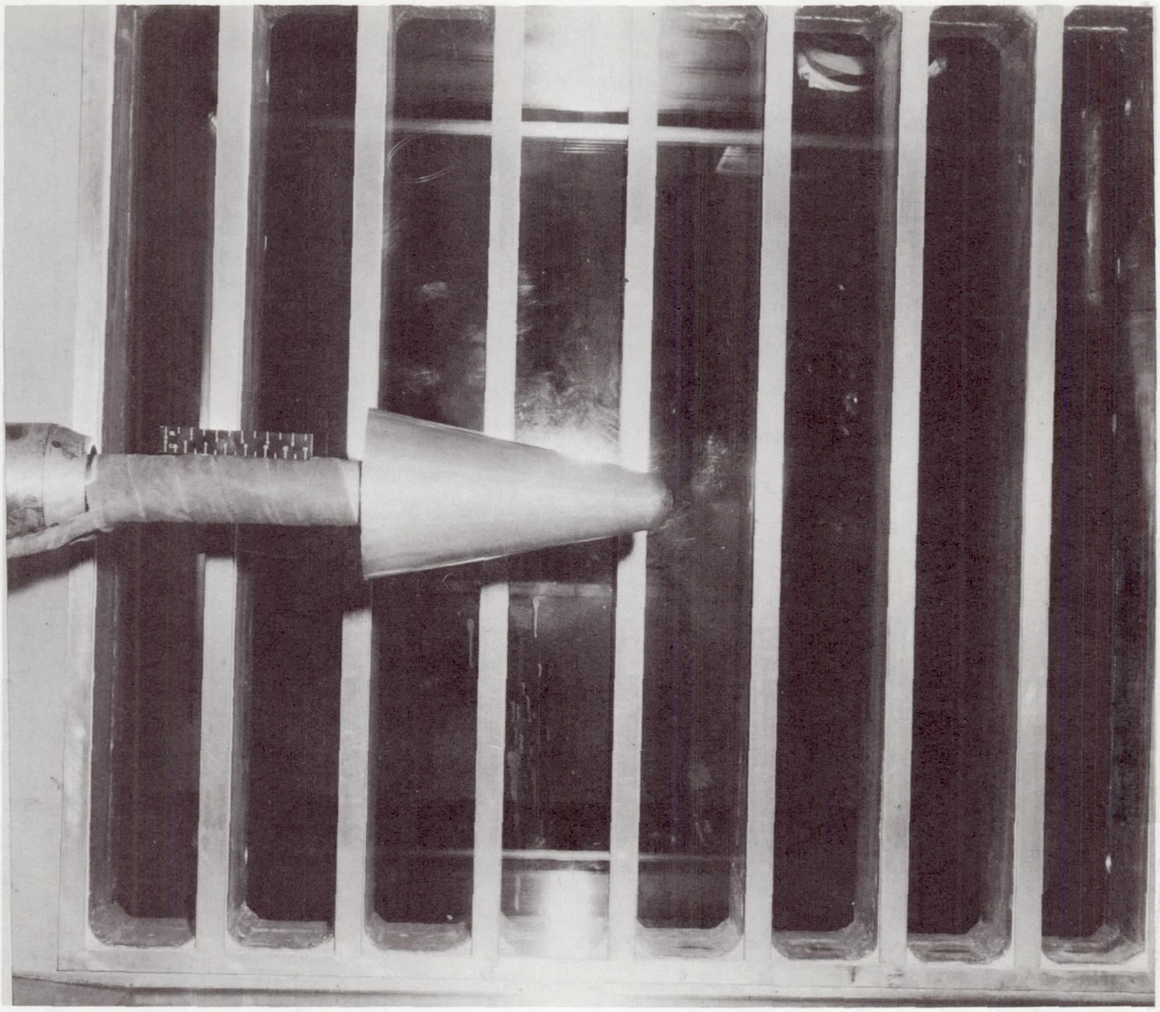


(a) Model 1; d = 0.572 ft (0.174 m).



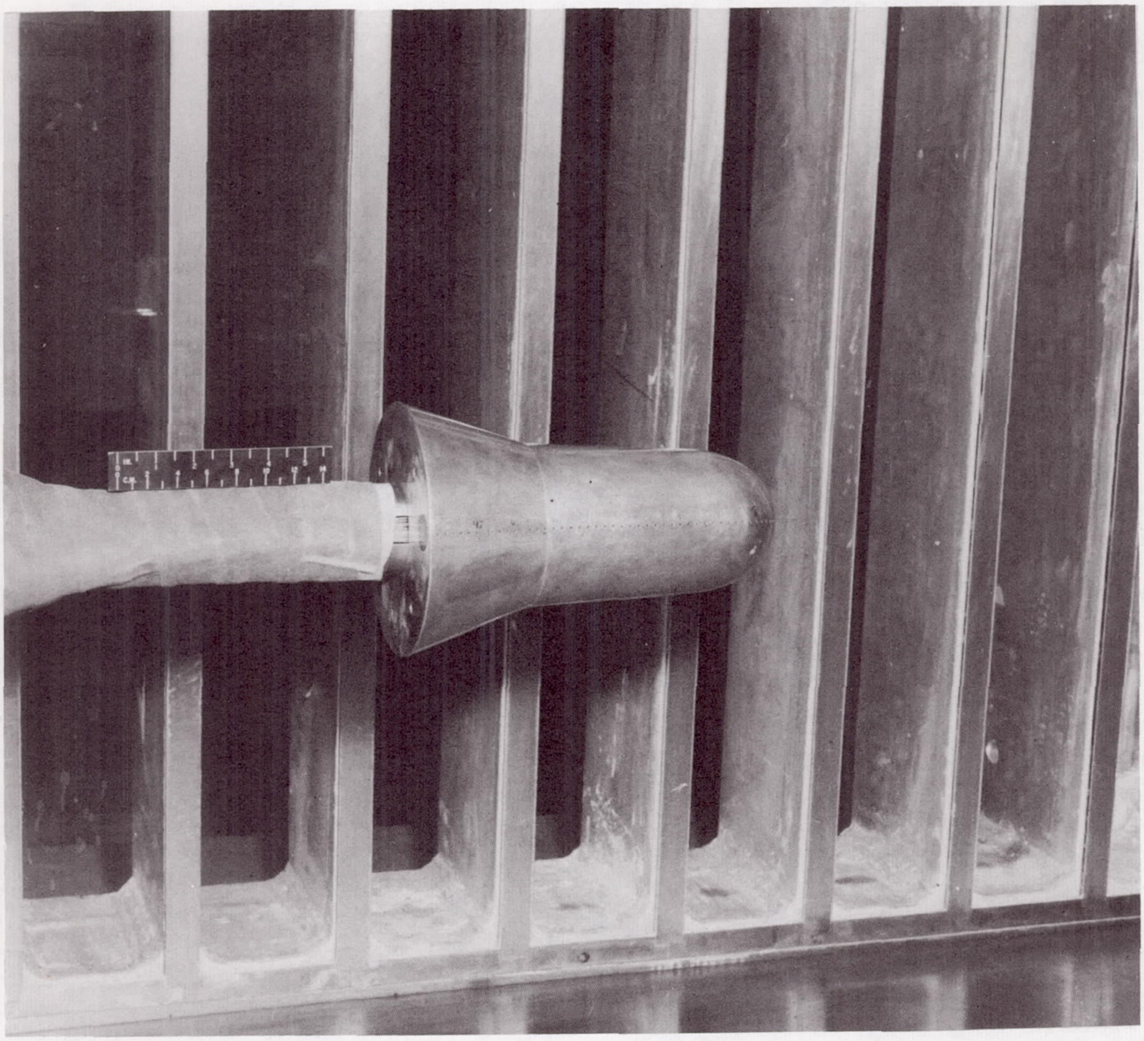
(b) Model 2; d = 0.583 ft (0.178 m).

Figure 3.- Model details. (All dimensions are in terms of base diameter.)



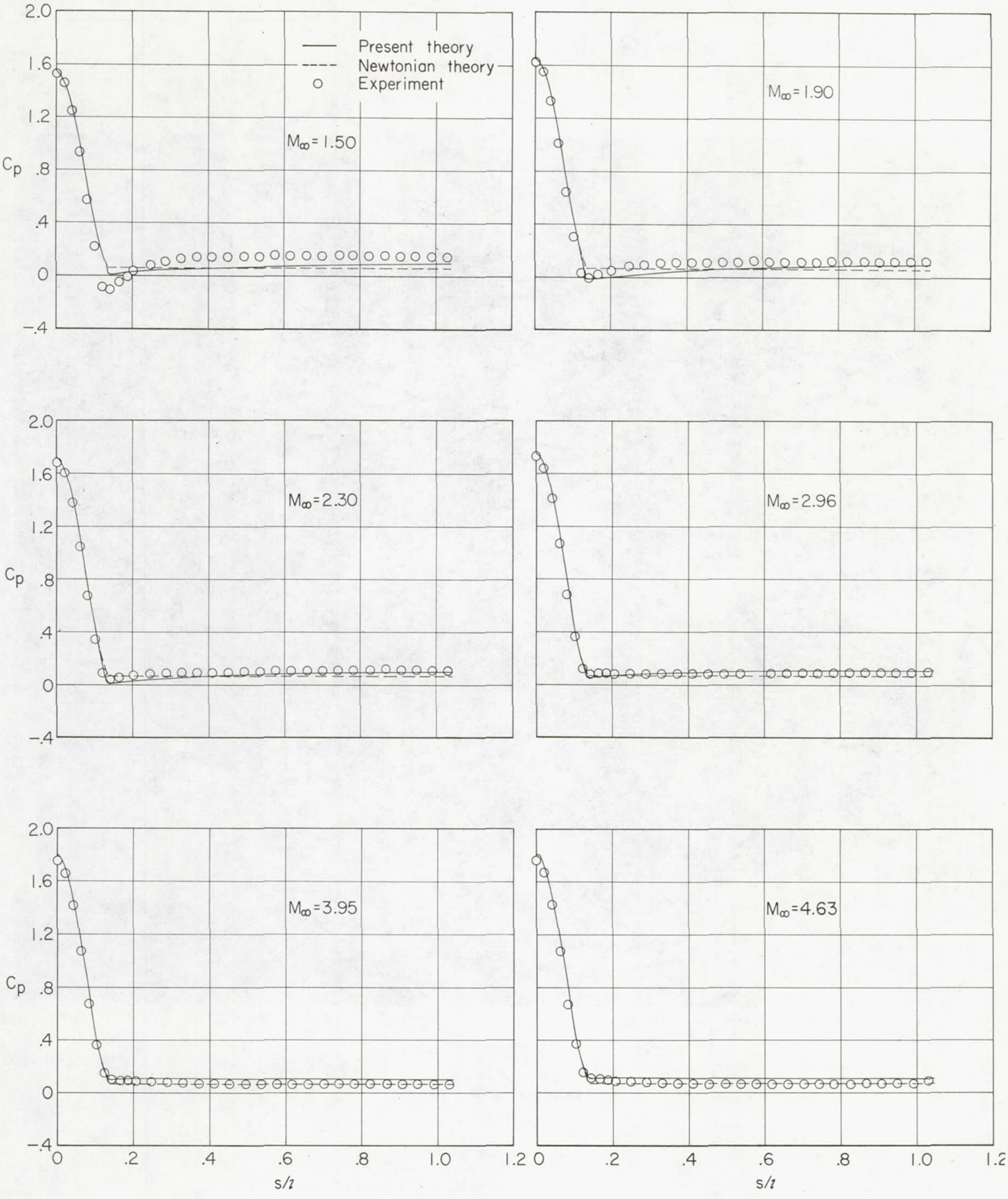
(a) Model 1. L-66-9549

Figure 4.- Model photographs.



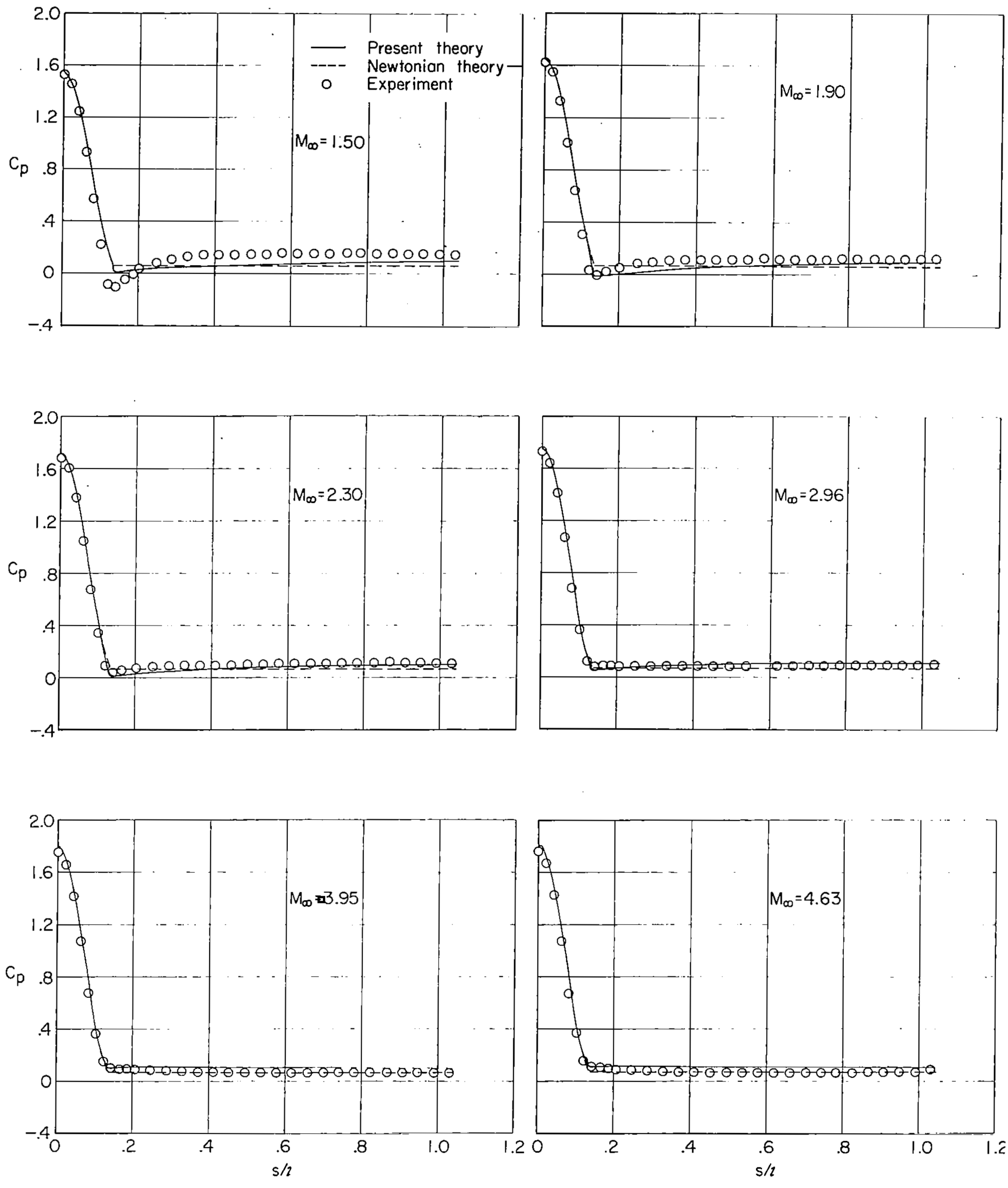
(b) Model 2. L-66-9548

Figure 4.- Concluded.



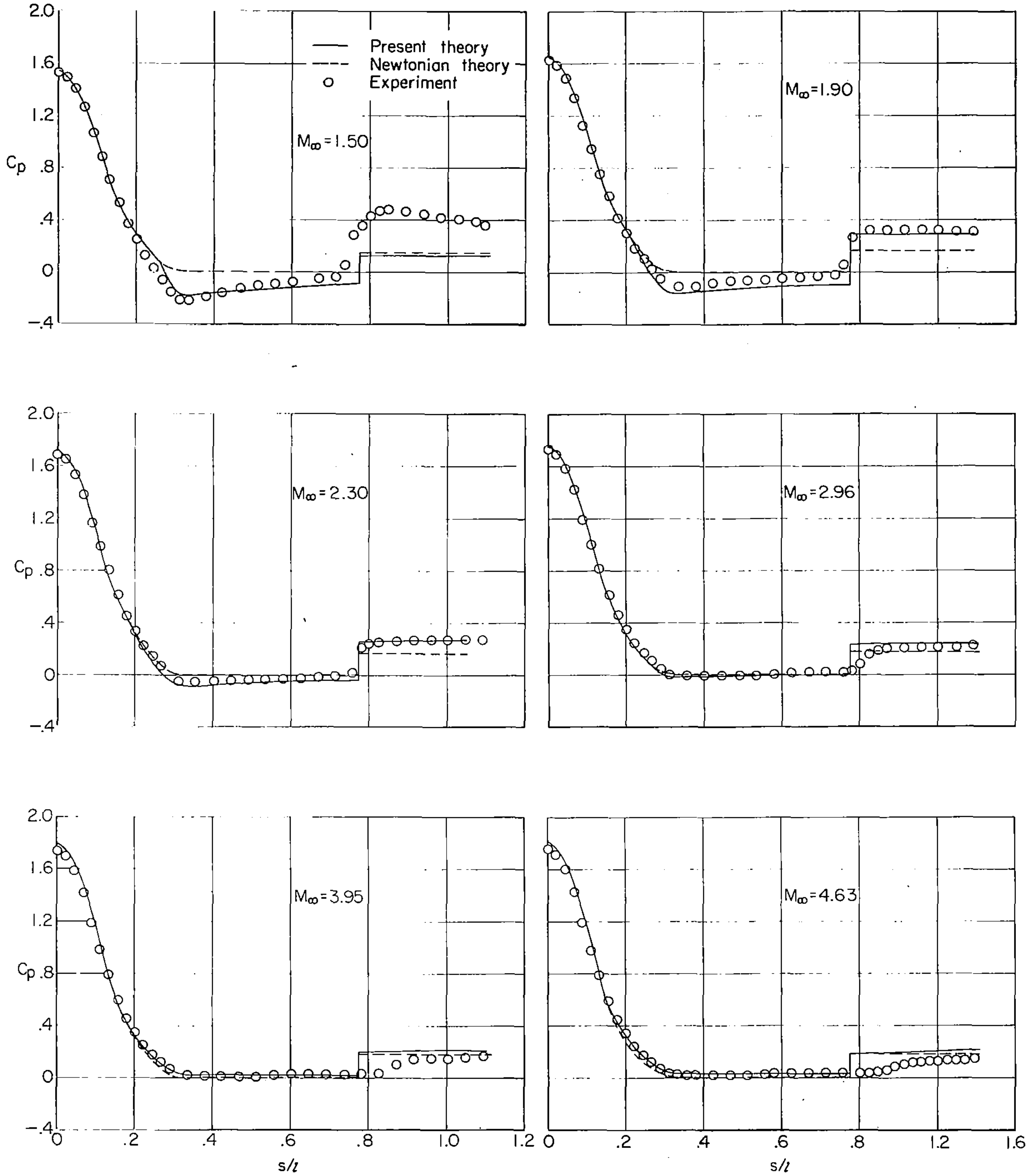
(a) Model 1.

Figure 5.- Longitudinal variation of surface-pressure coefficients obtained from theoretical methods and experimental data. $\alpha = 0^0$.



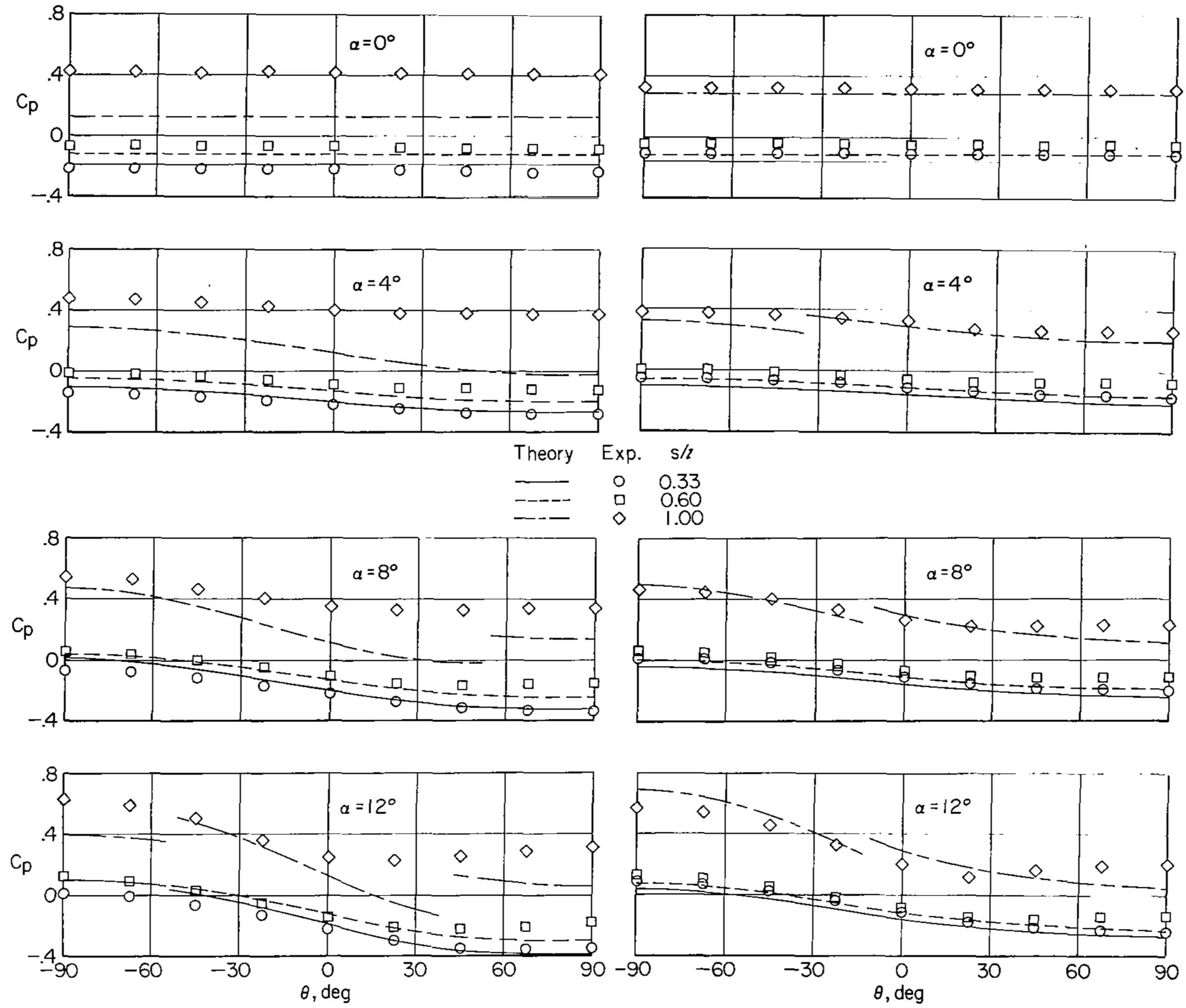
(a) Model 1.

Figure 5.- Longitudinal variation of surface-pressure coefficients obtained from theoretical methods and experimental data. $\alpha = 0^{0}$.



(b) Model 2.

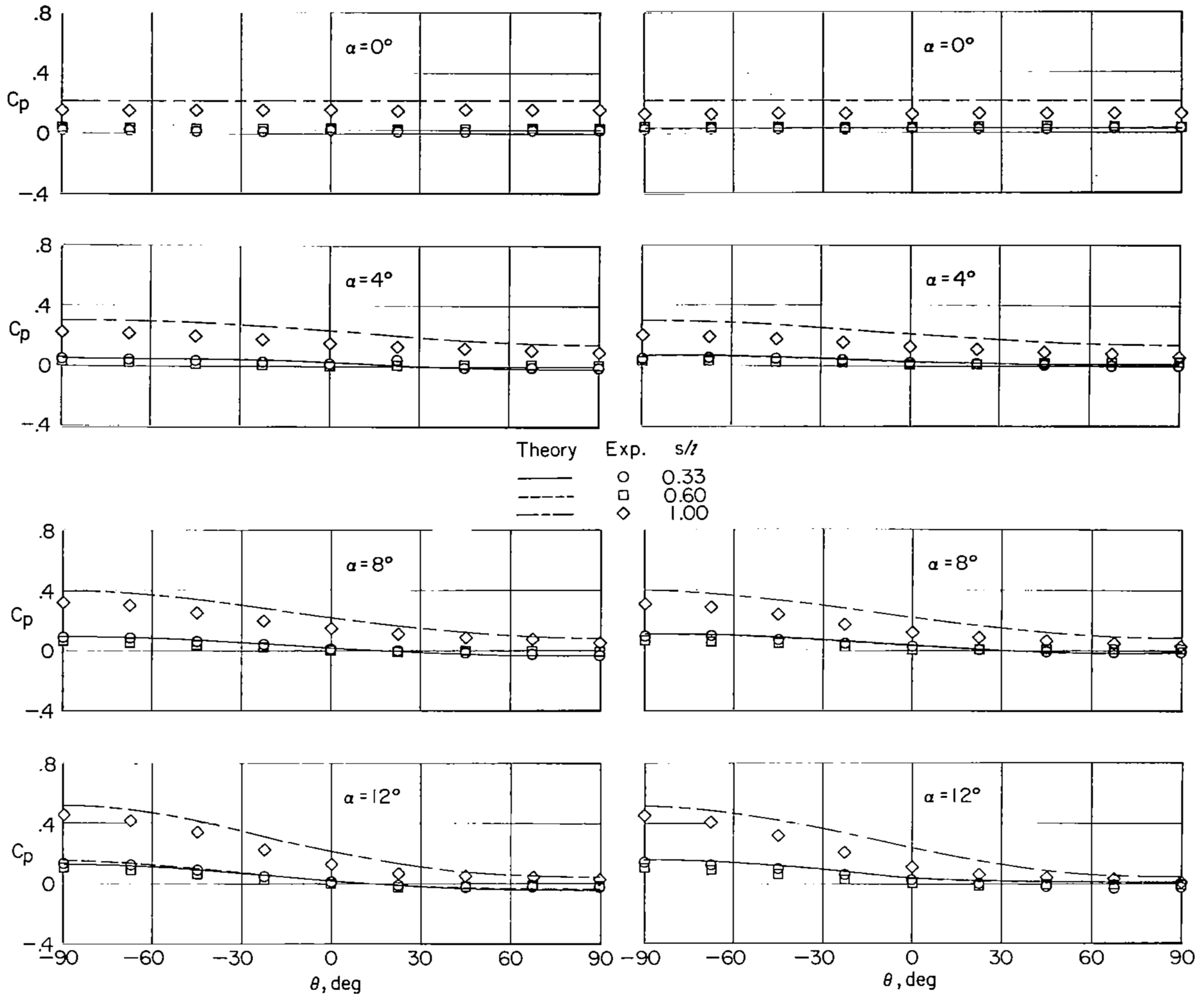
Figure 5.- Concluded.



(a) M_∞ = 1.50.

(b) M_∞ = 1.90.

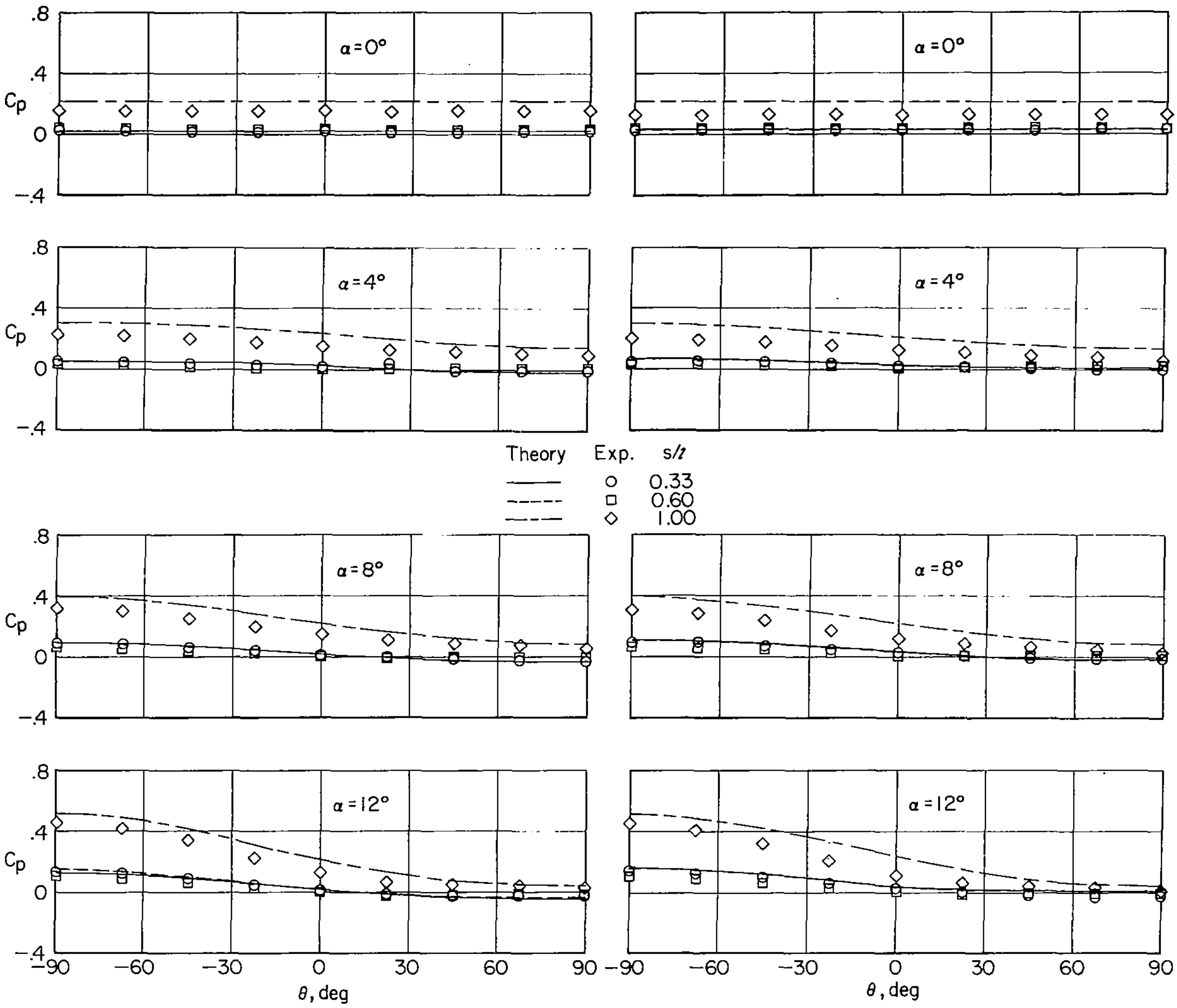
Figure 6.- Comparison of radial pressure distributions obtained from present theory with experimental distributions for model 2.



(c) M_∞ = 2.30.

(d) M_∞ = 2.96.

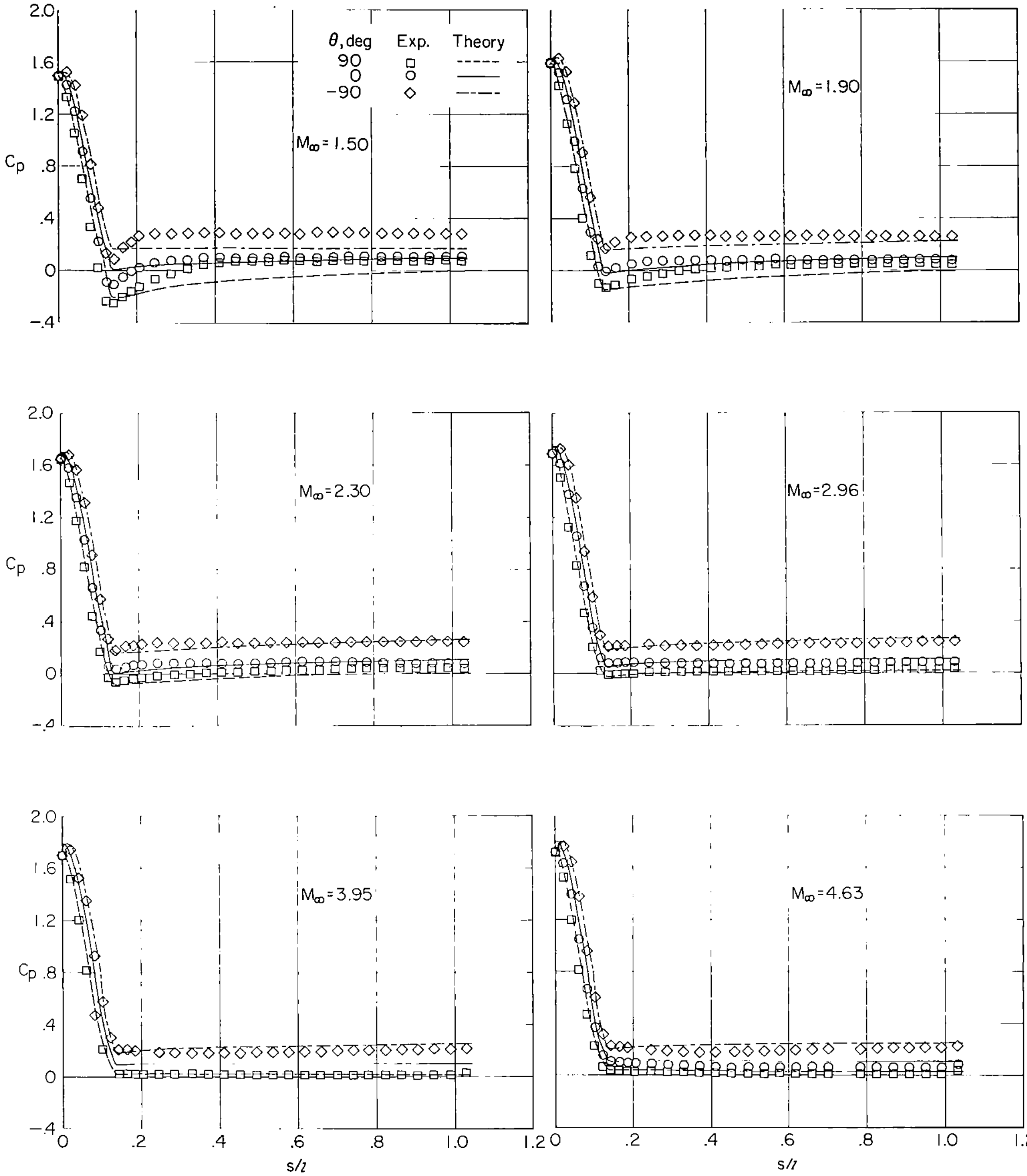
Figure 6.- Continued.



(e) M_∞ = 3.95.

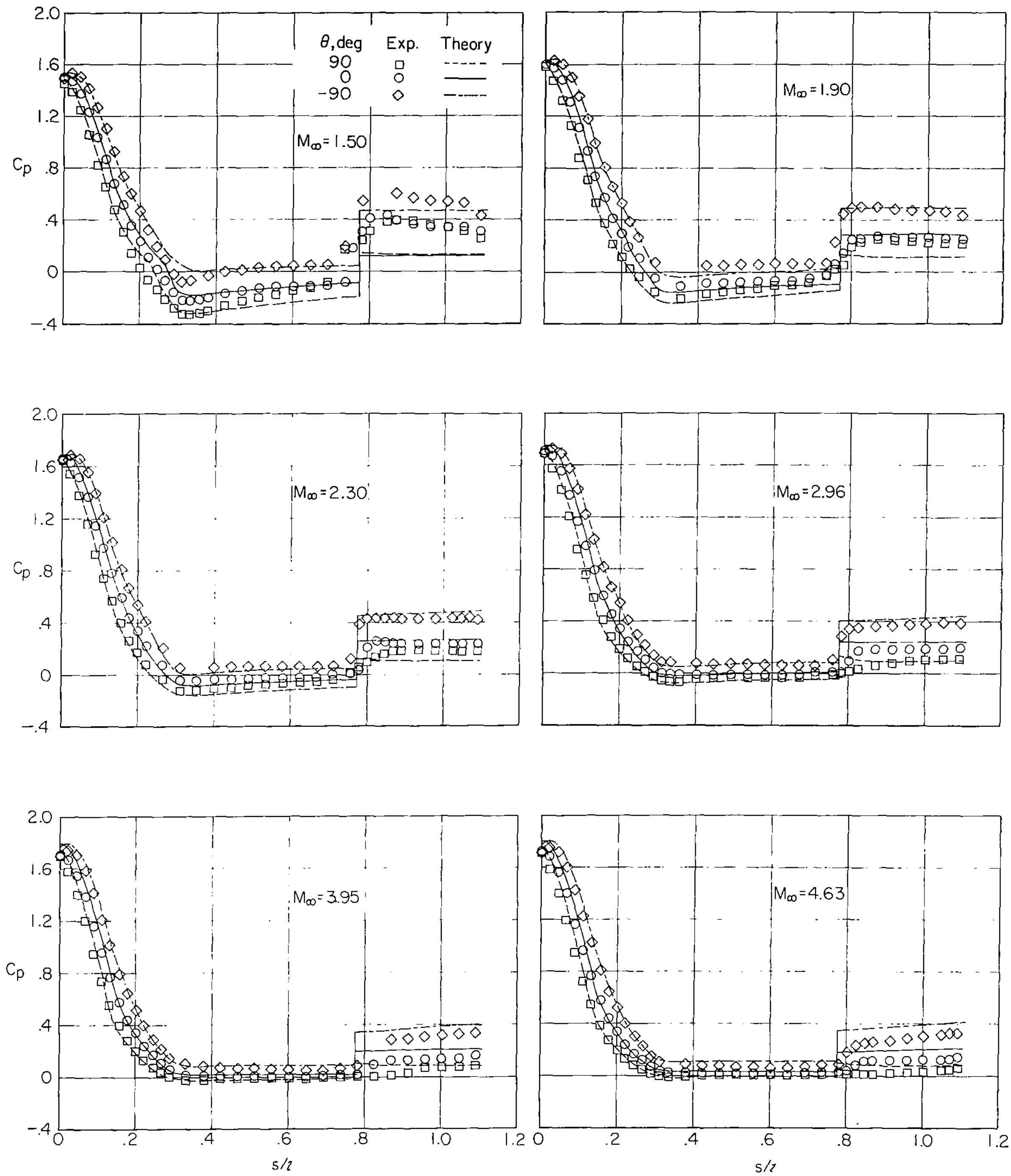
(f) M_∞ = 4.63.

Figure 6.- Concluded.



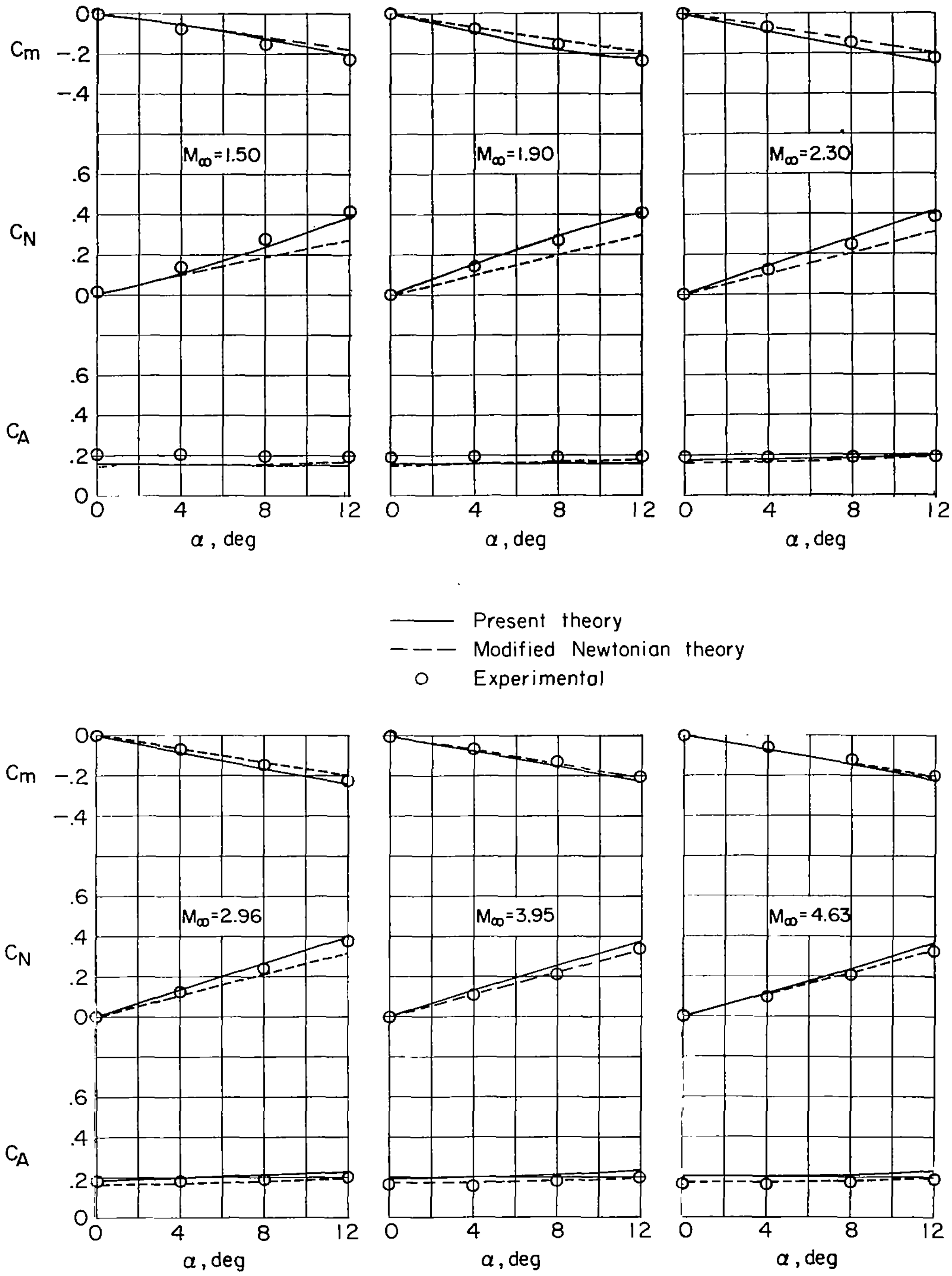
(a) Model 1.

Figure 7.- Comparison of surface pressures obtained from present theory with experimental pressures at $\alpha = 8^0$.



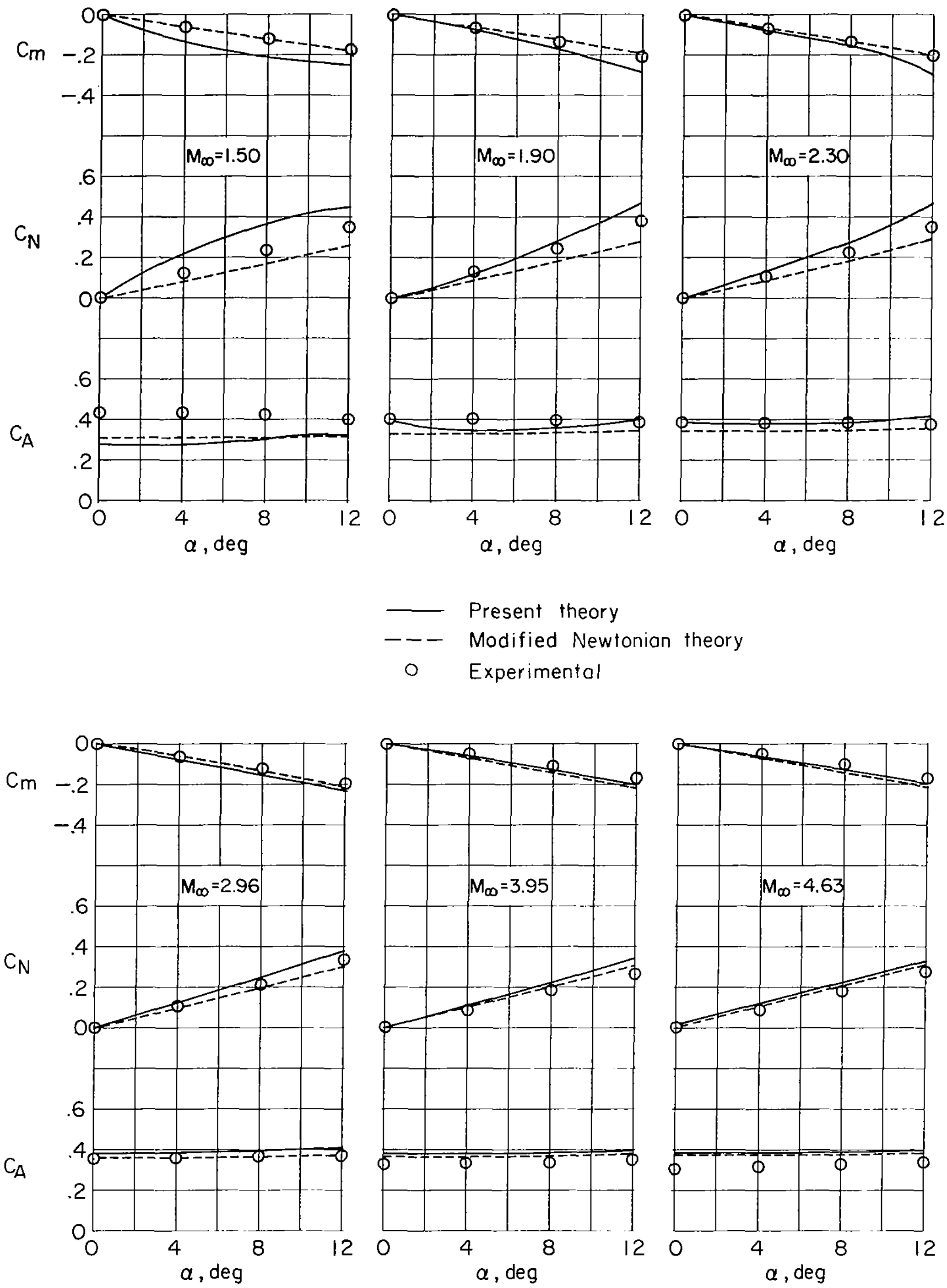
(b) Model 2.

Figure 7.- Concluded.



(a) Model 1.

Figure 8.- Comparison of theoretical estimates of forces and moments with experimental results.



(b) Model 2.

Figure 8.- Concluded.

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